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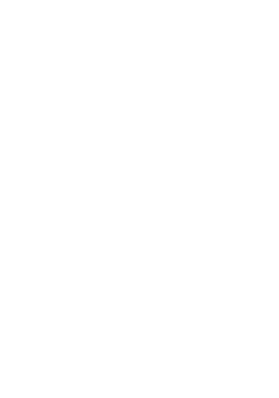
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CONTRIBUTORS TO VOLUME XVI

ABBE, TRUMAN	185, 227	LEONARD, V. N	390
ADAIR, FRED L	99	LEWIS, ROBERT M	308, 707
ALLISON, NATHANIEL	704	LODER, HALSEY B	701
BARRETT, CHANNING W	28, 106, 113	LLAE, H CLIFTON	20.5
BARTLETT, WILLARD	98	LYNCH, FRINK W	113,694 406
BALER, ALBERT	474	MACCARTY, WILLIAM CARPENTER MARVEL, W. J.	
BELL, W BLAIR	569	AIARVES, W	312 96
BELL, W. BLAIR	651	MASON, J. M.	90
BENEDICT, A L	606	Mayo, William I	233
BERRY, JOHN MCWILLIAMS	54 662	Mc Vernur, L. L.	460
BORCHGREVINE, O J		McCord, Carfy Pratt	418
BRENNECKE, H. A.	200	McClrdy, Stewart L	200
BROWN, JAMES SPENCER	709		420
Brown, Jone Yorks	610	McGlanny, Alexius McGuire, Edgar R	40
BUFORD, COLLMAN G	441	McKenn, C Hugh	322
CARY, ELGENE	362, 455	Marin 1 Manuel	400
CLARE JOHN G	±25	MILLER, A MERRILL MILLER, JAMES RAGIANO	315
CONNELL I GREGORY	353	MONTGOMERY, E. E.	20
CORNELL LOWARD L	477 701	Moore, James E	618
COTTON FREDERIC J	712	MORAY, JOHN F	210
COUGHLIN, W T	627	MURLIN, JOHN R	
Connect Harrens D	113		43 493
CUBBINS, WILLIAM R CULLEN, THOMAS S	265	MURPHY, JOHN B NEEL, J CRAIG	293
DAVISON, CHARLES	439	NEUROP, HAROLD	481
Da, Entro II	160	NoLAND, LLOYD	213
DICEINSON, ROBERT L	230, 281	Ocnsven, A J	480
Darnester Treoper ()	14	O'Britis Ancies	704
DECEMOND, HAMILTON	656	O'REILLY, ARCHER L'ACKARD, HORACE	100
EASTMAN, JOSEPH RILUS	541	PEARCE, RICHARD M	411
ELSBERG, CHARLES A	117	Peters, W W	228
FISCH, WILLIAM E	533	PETERSON, RELBEN	563
FLETCHER, FREO	216	PLUMMER.S C	1, 110
FORESTER, OTTRID	463	PORTER, JOHN L	334
FORBES, A MACKENZIE	81	PRINCE, I. M	022
FRAZIER, CHARLES II		REDER, FRANCIS	218
PULLERTON, WM D	553 180	REMSEN, CHARLES M	386
FURNISS, HENRY DAWSON	¢63	RENSEN, CHARLES M.	135, 223
GALLOWAY, HERBERT P II	84	ROBINSON, SINUEL	200
GELLHORY, GEORGE	284	ROCKEY, A E	424
GOLDTHWAIT, JOEL E	587	Sampson, John A	144, 304, 583
GOOD, TREDERICK LEG	329	SCHILEY, W S	221
HALPENNY, JASPER	595	SCHLIMPERT, II 1/2	483
HASSELER, J WATERS HEAVEL, N SPROAT	206	Schrager, V L	359
HEAVEL, N SPROAT	713	Suchan, J W	302
HECKY, D ORSAY	475	Э. Suite, Joseph T., Jr,	403
HESSERT, WILLIAM	566	Speese, John	571
HERTZLER, ARTHUR E HERZOG, MAXIMILIAN	94	STANDISH, MYCCS	536
HILL, CHARLES A	14	TAUSSIG, FRED J	92
HIEST, BARTON COOKE	712	TAYLOR, HOWARD CANNING	291
HONN, WILLIAM FRANCIS	206	TOREK, FRANZ	614
	548	TROUT, HUGH H	560
JACKSON, JABEZ N . JAMES, C S	432	TURCE, RAYMOND C WEIDEL, WILLIAM	325
JAMES, C S	302	WELLINGTON, J R	251
JONES, WALTER CLINTON	63, 632	WERDER, X O	74
Jupo, E S	379	WERELIUS, AXEL	579
KANAVEL, ALLEY B	438, 541	WINTING, FRED	141
KELLY, HOWARD A	. 308, 707	WILLIAMS, FSPY M	376
KEYES, EDWARD L , JR	79	WILLIAMS, PHILIP F	205
Kolischer, G	332	WILSON, LOUIS B	411 240
Kosmak, Geo W	230	WINSLOW, RANDOLPH	- 570
KRETSCHIER, HERMAN L	_34	VAN ZWALENBURG, C	422
LANE, W ARBUIENOT	600	, .	44.5
		i	



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NUMBER I

DYSTOPIC KIDNEY!

By S. C. PILMMER, M. D., CHICAGO

PEINITION. By dystopic kulneyrenal dystopia, or congenitally me placed kidney is meant a condition in which the kidney is athormally situated in the lody, never having occupied its normal position. This is in contradistinction to movable, or floating, kidney, where a kid ney has become displaced from its normal position.

The two conditions differ in the anatomy of the kidneys concerned especially as to vascularization, in clinical manifestations, in physical findings and in the indications for treatment.

According to Guizetti and Pariset (quoted by Anitschkow) (1), congenital dystopic kidney is found about once in every one thousand autopsies.

In this paper I shall not consider horseshoe kidney,

Embryonal asandering Pohlman (19) explains the embryonal wandering of the kidney plains the membryonal wandering of the kidney from the small pelvis to its normal permanent position. This process of ascent and rotation may cease at any point short of normal, or may be influenced by factors forcing the kidney from its normal course. In such a case the kidney never reaches its normal habitat, but becomes permanently faxed in an abnormal location. Alterations in size and shape lrequently follow from imperfect development or from adaptation of the kidney to its anatomical environment

Hill (10) says that "there is no vasculari-

zation of the kidney until it has reached its permanent position." If, then, this permanent position is the normal position, the renal ve-sels have the usual normal origin and follow the usual course, but if the permanent position is abnormal, the renal vessels originate from some near-by arterial trunk and tend to take a direct course to the kidney.

Strater (20) says that the kidney during its embryonal wandering passes the region of several arteries and is, during this time, supplied by several vessels. If the wandering stops before the normal location is reached, these properly temporary vessels become permanent ones.

Hill's observations seem to prove the truth of his statement, but, accepting either view as to the temporary vascularization, there is no disputing the fact that the permanent vascular supply is from the vascular territory, where the kidney takes its definitive location. The vascular supply is abnormal, because the location of the kidney is abnormal, the supply adapting itself to the location of the kidney. The abnormal vascularization, being thus a secondary matter, is not a cause of renal dystopia.

Anatomy. In size, the dystopic kidney is generally approximately normal, although sometimes it is found to be considerably less than normal size, as in one of the specimens which I describe.

The shape is often normal, but more frequently there is some variation from the

Read before the Chicago Surgual Society May 5, 2012 (See discussion p 109)

normal, one of the most common variations being due to its resting on the promontory of the sacrum, the sacro-like joint, or linea innominata, in consequence of which a furrow or depression is found on its posterior surface. Furrows lodging the vessels are also found, as strikingly shown in the specimen from my patient. Persistence of the fortal lobulations have been noted in several cases.

The origin of the vessels supplying a dystopic kidney is always from a point lower than the normal Frequently the artery arises from the lower portion of the actray arises from the origin in a considerable number of cases. In other cases the artery has arisen from the common illac, internal lilac (hypogastric), the median sacral or the inferior mesenteric artery. I have seen no case noted where the artery took its origin from the external illac. Antischkow describes two cases where a left dystopic kidney received.

an artery from the right common iliac.

The vascular supply is in most cases a
liberal one, and two or more arteries and
veins are not infrequently found leading to a
dystopic kidney. Meyer (rs) declaring to
is to be the usual condition. Anitsehkow (r)
says a solitary artery is the exception. He
describes one kidney with five arteries.

As a rule, the origin of the vessels is sufficient to distinguish a congenitally misplaced from a movable kidney. In Bi-sell's (3) case there was some difficulty in determining this point, because, although renal vessels of normal origin, elongated and reduced in calibre, led to the right kidney which was located in the pelvis, there were two supernumerary arteries arising from the internal iliac (hypogastric) or its branches and entering the lower pole of the kidney.

A full discussion of the vascular supply of misplaced kidneys will be found in the articles of Meyer (15) and Anitschkow (1)

Anitschkow (r) attempts to classify the arterial supply of dystopic kidneys into four groups: First, those with a solitary artery arising from the aorta. Second, those with additional branches arising from the side of the aorta. Third, those with additional branches arising from branches of the aorta.

Fourth, those with no direct branch from the aorta, the entire supply coming from branches of the aorta. He describes a number of specimens in which one of the renal arteries, or a branch of one, enters the kidney substance directly, not going to the hilum. He also calls attention to the frequency with which the arteries run in grooves upon the surface of the kidney before entering its substance, thus more of less completely "engirdling" the kidney. This is seen in my specimens. No. 1 and a.

Meyer and Antischkow both call attention at the anomalies of the renal veins. In a general way, the veins empty at points corresponding to the origin of the arteries. In some cases a persistent portion of the embryonal cardinal vein assists in the formation of a renal vein.

The ureter is generally shorter than normal, especially so where the kidney occupies a position wholly or partly within the pelvis. The ureters open into the bladder at the normal site, as a rule, even in crossed dysteric as a rule.

topia, as seen in my case. The location of the misplaced kidney varies within wide limits Frequently it is found entirely within the small pelvis, sometimes behind the uterus, at other times at one side of the uterus Many more are partly within the small pelvis, resting upon the promontory of the sacrum, the sacro-iliac joint, or the linea innominata Others are found higher up, in the iliac fossa, at the side of the vertebral column or upon the front of the vertebral column Of all localities, the rarest is that of the mural kidney, the location being in a pocket of the parietal peritoneum, a case of which is reported by Dorland The misplaced kidney is usually found upon the side where it normally belongs, but cases of crossed dystopia are not extremely rare In the latter case there is, in the majority of instances, end-to-end fusion of the kidneys, forming the so-called sigmoid kidney, although in a lesser number of cases the two organs, quite distinct, lie upon one side of the vertebral column, a condition which Dorland (7) in his classification designates "right- or left-sided double kidney (non-fused)."

As my personal case was of the class last named, it is interesting to note here that Cathelin (quoted by Sträter) found in nineteen cases only five where fusion was absent; Mennacher (quoted by Dorland) found nine

cases, and Dorland four cases.

In contradistinction to floating kidney, the congenitally misplaced kidney is more commonly the left. Thus Cadoré (quoted by Strater) in forty-five cases found the right kidney misplaced thirteen times, the left twenty-nine times, both kidneys three times Nearly all these were discovered at autopsy. Of Strater's sixty-seven clinical cases, fifty-seven record which kidney was displaced, as follows: Right, 10; left, 34; both, 2; supernumerary, 2.

The misplaced kidney is, with the rarest exceptions, retroperitoneal. Cases have been found where the kidney is partially between the layers of the mesosigmoid, or partially within the broad ligament, Strater's personal

case was entirely intraligamentary.

The adrenals do not accompany the kidney in its dystopic location. Strater says that they are always found in their normal locations and the recorded cases do not hear out

Morris' (r6) observation that the adrenals were displaced in nine out of twenty cases.

Defects in the genital organs of both sexes, of the bladder and of the rectum have been noted in cases of misplaced kidney. If the defect of the genitalia or bladder is unilateral, it is found on the same side as the misplaced kidney.

Among others, the following defects have been reported. Unicorn uterus; bicom uterus; double uterus; uterus and one tube absent, uterus, upper part of vagina and inner portions of tubes absent; uterus and vagina absent, testicle atrophic and located in inguinal canal; one-half of bladder partially undeveloped; one-half of bladder absent; attesia ani.

Cullen (6) reports a case of right pelvic kidney, the left kidney being absent, in which the uterus and vagina were absent and in which both ovaries, with portions of the tubes and round ligaments, were located in the inguinal canals.

Dorland (7) collected from the literature, during the twelve years, 1898 to 1910, one hundred and twenty-one cases of renaf anom-

alies, to which he added reports of two personal cases, making one hundred and twentythree in all. Of these, twenty-one were misplaced kidneys without fusion of the two organs.

Tathology In the majority of cases the misplaced kidney is normal in structure, but its abnormal location does not exempt it from the pathological conditions found in kidneys normally located; in fact, its location at times would seem to favor hydronephrosis (which, if infection occurs, becomes pyone-phrosis), on account of interference with the flow of urine through the ureter.

In his sixty-seven clinical cases, Sträter found twelve cases of hydronephrosis and six of pyonephrosis. Other pathological conditions found are calculus, sarcoma, tuber-

culosis and cystic degeneration.

In Brooks' (a) case there was a twin pregnancy at three months, the kidney was compressed and rotated so as to compromise its vascular supply. Death resulted from uramia. The other kidney, normally situated, showed acute hemorrhagic nephritis.

Clinical manifestations. The symptoms caused by a misplaced kidney otherwise normal are most frequently similar to the symptoms caused by diseases of the uterine adnexa. While in autopsy findings misplaced kidneys are about equally frequent in the two sexes, the clinical cases are much more frequent in women Sträter, in his sixty-seven clinical cases. found normal kidneys forty-two times in women and four times in men. This is accounted for partfy by the fact that a kidney located in the small pelvis is more prone to cause symptoms in a woman than in a man, and partly by the greater frequency of pelvic examinations and pelvic operations in women, these leading to the discovery of the abnormally pfaced kidney.

Common symptoms are pain in the lower abdomen, in the back, loins, buttocks, sometimes radiating lato the lower limbs; a feeling of weight in the lower abdomen, all of which are subject to aggravation at the menstrual periods. Pain on colius has also been noted.

The question has arisen as to bow far the disturbances of menstruation are due to the misplaced kidney, and how far to coexisting



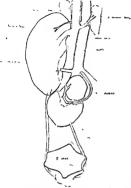


Fig 1 Anterior view of specimen No 1 I rom the museum of Rush Medical College

pathological conditions of the adnexæ Strater holds that the kidney may, of itself, cause such disturbances and cites his own case in proof.

In some cases the symptoms are due to pressure on the rectum, constipation being the chief complaint. In Chavanner's case, cited by Strater, a left hydronephrotic kidney, lying between the leaves of the mesocolon, led to a diagnosis before operation of carcinoma of the sigmoid.

At other times bladder symptoms predominate, enuresis and tenesmus being the more frequent manifestations Symptoms due to pressure on the vena cava bave never been pronounced.

Psychic disturbances have been noted in two cases.

The uterus and other pelvic organs may be displaced by a pelvic kidney.

The question as to whether a misplaced kidney can be the cause of abortion is not settled. There are a considerable number of cases reported where parturition was interfered with, sometimes only to the extent of lengthening the duration of labor, but at other times causing abnormal presentations and in one case rupture of the uterus.

In pathological conditions of the userus.

In pathological conditions of the usiplaced Lidney there are found, in addition to the symptoms already noted, the symptoms condinarily accompanying the pathological condition with which we may have to deal. In hydronephrosis, the most common pathological condition, the symptoms have been intermittent in several cases, just as in hydronephrosis in a normally placed kidney, Other conditions, as stated above, are pyone-phrosis, calculus, sarcoma, tuberculosis and cystic degeneration, each exhibiting the symptoms ordinarily expected in those conditions

Diagnosis. In favorable cases palpation is of great assistance in making the diagnosis. If the kidney is otherwise normal, one can make out the size, shape and consistency, and in some cases even the hillum with its pulsating

artery can be identified.

Failure to find a kidney in the normal location is confirmatory of the nature of the tumor under investigation, but, owing to the fact that normal kidneys normally located frequently cannot be palpated, this negative evidence is not of great value. On the other hand, finding both kidneys in the normal location does not exclude the possibility of a dystopic supernumerary kidney, as shown in one of McArthur's cases.

The misplaced kidney is generally so fared in its retroperitioneal location that it is scarcely at all movable. Certain cases have, however, acquired a considerable mobility, and in some cases the kidneys are not entirely retroperitioneal, but partially intraligamentary, thus having more mobility. An entirely intraligamentary kidney, of which Strider's case is the only example, would be still more movable.

This fixation, absolute or relative, is one of the distinguishing points between misplaced and movable kidneys, the latter having great mobility, as a rule, although in some cases fixation in an abnormal position is acquired by a movable kidney

Catheterization of the ureters sometimes shows a considerable difference in the lengths of the two ureters, differences of from ten to fifteen cm, having been noted.

Inserting into the ureters bougies which cast a shadow with the X-ray and then taking a skiagram will give valuable information. The X-ray is also of value by showing the shadow of the kidney and thus indicating its location.

Munro (17) says that the cystoscopic examination has several times revealed a pulsation in the trigone due to an underlying renal artery.

Misplaced kidney is more common on the left side, whereas movable kidney is more common on the right side.

Finding some of the anomalies of the genital apparatus noted above will furnish confirmatory evidence.

If the kidney is exposed by operation, the most decisive finding is the ahnormal origin

of the vascular supply.

In pathological conditions of the misplaced kidney we find the symptoms and signs common to these same conditions, when found in the normally placed kidney. If the ureter is patulous, the urinary findings will aid in the diagnosis.

Differential diagnosis. Misplaced kidney is most often mistaken for a tumor of the adnexæ, especially an ovarian cyst If a pelvic kidney is pyonephrotic, it may be mistaken for a pus tube. If the symptoms are chiefly referable to bowel disturbance, carcinoma of the bowel may be suspected If there is an accompanying defect of the vagina, hæmatometra may be diagnosed. Cases have been diagnosed appendicitis, pericystitis, retroperitoneal cyst or tuberculosis of mesenteric glands. In two reported cases the symptoms were preceded by trauma, in one of which ileus was diagnosed, in the other hæmorrhage with peritonitis.

Treatment. Strater, in 1906, collected sixty-seven clinical cases of dystopic kidney. to which I have been able to add seventeen cases, making eighty-four clinical cases in all.

In sixty-three of these cases operations referable to the kidney were performed.

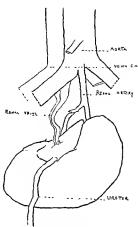


Fig 2. Antenor view of specimen No 2 From the museum of Rush Medical College

Fifteen of these operations were exploratory as far as the kidney was concerned, nothing being done to the kidney heyond exposing it sufficiently to make sure of the condition, Forty-eight of the operations included some procedure involving the kidney. These procedures were nephrectomy, 34 times; nephrotomy or pyelotomy, 3; shifting the position of the kidney and re-implanting it, 3; removal of calculus, 3; excision of part of the kidney, 2; fixation to abdominal wall, 1; attempted nephrectomy, 1; and puncture after trauma, r.

The results were as follows: Nephrectomy: recovery, 23; deaths, 7; not stated, 4. Nephrotomy (or pyelotomy): recovery, 1; death,

Re-implantation: recovery, 3. Removal of calculus: recovery, 3. Excision of part of kidney: death, 2. Fixation to abdominal

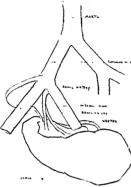


Fig 3 Posterior view of specimen No 3 I sum the museum of Rush Medical College

wall: not stated, s. Attempted nephrectomy: death, s. Puneture after trauma: death, s.

In three of the nephrectomies the removed kidney was proved at autopsy to have been solitary. In both cases of excision of a part of the kidney the antopsy showed that there was no other kidney

In order to make these statistics of value, the cases in which the kidney structure was normal should be separated from those in which a pathological condition was present.

We will exclude from the thirty nephrectomies in which the result is stated the three where the kidney was proved to be solitary, making death inevitable. Of the remaining twenty-seven cases, thirteen showed normal kidneys and fourteen pathological, of which latter nine were hydronephrotic and five pyonephrotic.

Of the thirteen cases where nephreetomy was performed, the kidney being normal, ten recovered and three died. In one of the recovered eases the removed kidney was supernumerary. Excluding this one case of supernumerary kidney, there remain twelve cases of nephreetomy, of which three died, making a mortality of twenty-five per cert. In two of the fatal eases it is not stated whether the second kidney was proven to be present or not. In my own case, which ended fatally, the second kidney was present and was considerably above the average size. The

autopsy showed it to be normal in structure Of the fourteen eases where nephrectomy was performed, the kidney being in a pathological condition, thirteen recovered and one died The one fatal case was that of a child

of fourteen months with pyonephrosis.

Of the three cases where nephrotomy was performed, two were pyonephrotic, both of which died, one was a patient with intermittent hydronephrosis, who was living more than explicten months after the operation,

but still required a drainage tube.

The three cases where re-implantation was performed all showed normal kidneys and all recovered.

In the three cases where a calculus was removed, there was normal kidney tissue, but in one case the kidney was about one-half normal size, and in one case the kidney was supernumerary. All three recovered.

Of the two cases where excision of part of the kidney was performed, both were solitary kidneys, one of which was of normal structure, and the other had a tubercular lower pole, which latter was removed. Both died.

The case where fixation to the abdominal wall was performed is but briefly reported, and it is not stated whether the kidney was normal, but we may assume that it was. The result of the operation is not stated

The case of attempted nephrectomy was in a patient where drainage had previously been performed for hydronephrosis. Adhesions rendered the nephrectomy impossible. Death.

The case where puncture was performed after trauma showed a most unusual anatomical arrangement. The kidney had four lobes, each with its own pelvis and ureter. These four ureters emptied into a sac containing one

litre of bloody urine. One ureter led from this sac to the bladder. The sac had been ruptured by the trauma. Death.

In deciding upon the proper treatment of dystopic kidney, it is well to consider separately the cases where the kidney structure is normal, and those where a pathological

condition is present.

In all cases, of course, the imperative rule holds good, just as in the case of normally located kidneys, to determine the presence and functional capacity of the second kidney.

In pathological cases, the treatment must be the same as in similar cases in normally placed kidneys, the method of approach in operative cases being modified so as to adapt it to the abnormal location of the kidney.

In cases where the kidney is of normal structure, as a rule, no treatment is needed. If pronounced suffering or disability is caused, operative treatment is indicated. Mornis (16) states that nephrectomy is the proper procedure in such cases. The fact that in my case on ephrectomy death resulted from anuria, in spite of the presence of a second normal kidney of more than average size, makes me feel that this operation is too dangerous to be recommended except as a last resort.

Strater says that sometimes accompanying pathological conditions of the adnexe give rise to the symptoms attributed to the dystopickidney, in which case the diseased adnexæ should receive appropriate treatment and nothing done to the kidney until it is proved that other treatment is unavailing determined that the dystopia is the real cause of the symptoms, he recommends operative dislocation and fixation in another place his personal case, which was unique in presenting the only completely intraligamentary dystopic kidney on record, he was able to push a pelvic kidney up into the iliac fossa and retain it there by suturing, with entire relief of symptoms. He says that, if the symptoms are due to pressure on the bowel, a slight dislocation of the kidney is sufficient to give relief.

Munro (17) says that in a number of cases where the kidney has been transplanted, nephrectomy was required later, on account of the persistence of the symptoms. He adds

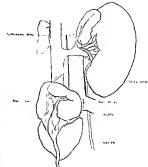


Fig 4 Anterior view of specimen No 4 From the museum of Rush Medical College Bladder arrangement normal. (See posterior view, Fig 5)

that a pelvic kidney probably cannot be transplanted, and hence advises removal of such a kidney, even though healthy, if it produces symptoms, because of mechanical interference with intestinal functions

I would sum up the treatment of cases of dystopic normal kidney as follows:

No operative interference unless the symptoms are of considerable severity.

If adnexe are diseased in such a manner as to make their removal proper, as, for instance, in cases of pus tube or ovarian cyst, remove the offending adnexe, leaving the kidney in situ. In many cases all symptoms will disappear; if not, the kidney may be dealt mith later.

If operation on the kidney itself is required, the operation of choice is dislocation of the kidney and re-implantationina location where it will not be a mechanical hindrance.

If the above procedures do not suffice or cannot be successfully carried out, nephrectomy, as a last resort, should be performed.

In all operative procedures on the normal

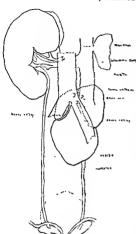


Fig 5 Posterior view of specimen No 4 I rom the museum of Rush Medical College

kidney, where nephrectomy is not from the first inevitable, great care must be exercised not to damage the kidney structure or vessels in such a way as to make the removal of the orean unavoidable

As to the method of operative approach in case of a normal dystopic kidney, it seems to me that ventral laparotomy is alone to be considered.

In pathological dystopic kidney other routes have been used Of these the sacral route appears to be difficult and unsatisfactory. Bevan (2) in one of his cases used a muscle-splitting incision, such as is employed for removal of the appendix, the peritoneum

was pushed back and the kidney reached retroperitoneally. Cragin (5) reports an unique case of vaginal nephrectomy following tapping of a hydronephrotic kidney. In the majority of these cases, also, a ventral laparotomy will be the procedure of choice.

rotomy will be the procedure of choice. In pregnancy and parturition a dystopic kidney may present new problems, if located in the small pelvis. The amount of interference with labor will depend upon the degree of narrowing of the diameters of the pelvis. The recorded cases show that delivery, although often prolonged and difficult, can take place in the majority of cases without operative interference.

The dystopic kidney, as a rule, has but slight mobility and consequently cannot be pushed up out of the way during parturition, as can many pelvic tumors.

Strater sums up the management of dystopic kidney in pregnancy and parturition as follows

If discovered at the beginning of pregnancy: laparotomy, dislocation, fixation.

If discovered later, consider the advisability
of the induction of premature labor.

Do not think of removing a normal kidney

shortly before or during labor

If discovered after labor has begun, a pathological kidney may be punctured to allow delivery, nephrectomy to be done after the

puerperium

If, during parturition, delivery cannot take
place without injury to mother and child,
cither, in case of a dead child, perform
craniotomy, or, in case of a living child,
Carsarean section, or an operation to widen the

pelvis Cragm (5), in the ninth month of the third pregnancy, made a vaginal uncision through which he removed a hydronephrotic kidney from his patient, first reducing the size of the kidney by puncture Filten hours later the patient was defivered of a living child She made a good recovery. I believe that in a similar case Cessarean section would be a safer procedure.

Wilson (22) says: "Version, as shown by the statistics of the collected cases, would seem to be too dangerous both to child and mother to receive serious consideration."

CASE REPORTS

My personal case was reported informally to the Chicago Surgical Society at its meeting held February 11, 1010, and published in the Transactions of the Society in SURGERY, GYNECOLOGY AND OBSTETRICS, Vol. X, No. 4, D. 431, April, 1010.

CASE 7 J B aged 38, male The patient complained of a swelling located in the region ordinarily occupied by the appendix vermiforms. After having been under treatment on the medical side of the hospital and discharged, he returned and insisted upon an operation to remove the tumor which he said caused him pain and total disability to perform manual labor.

The tumor was easily palpable and its resemblance in shape and consistency to a kidney was remarked it was practically immovable. The nature of this mass was not determined, but it was thought that

it was most probably a displaced right kidney On October 13, 1909, an incision was made through the rectus muscle near its outer border and over the tumor, which was found to lie retropertoneally and to the inner side of the ascending colon. The personeum over the tumor was nested and it with a kidney, whose lower portion lay on the brim of the relief.

An examination was now made as to the presence of other kidneys. Just above the maplaced kidney could be paipated, in the normal position on the right side, a kidney of normal shape, but larger than the average size. This proved later to be a normal kidney of large size. On the left side! I thought! paipated a third kidney un normal position, but small; paipated at third kidney un normal position, but small er than the average size. This proved later to halve been an erroneous observation, as there was no third kidney.

Thinking, then, that I had to do with a supernumerary kidney, which caused pain and dissibility, and that the patient was amply provided with renal situse without the kidney in question. I proceeded to remove it. The fillium was turned outward, that is, toward the right side, and the ven and artery could be seen crossing the anterior surface of the kidney in a deep groove. The ureter passed directly downward from the fillium to the bladder. The vessels, were ligated and the kidney removed. The poterior peritoneum was closed, and the mession in the abdominal wall closed without drainage.

Twelve hours after the operation, as the pattent had passed no turne, a catheter was passed, but no unne found. Twenty-nine hours after the operation one dram of urne was withdrawn by catheter. No more urne was passed until six full days after the operation, when three ounces were voided. The following day he voided urne three times, amounting to have ouncest in all. On each of the two following days he passed a small amount of urine, which was not measured. He died etn days after the

operation, having passed not more than ten or

During this time and up to within twenty-four hours of his death his general condition was remarkably good for a man who was passing practically no urine. Although at times treets was frequent, he had periods when he retained considerable amounts of fluid by mouth He also retained large quantities of normal sait solution per rectum Sweet spirits of nitre, caffeine, and potassium citrate were administered The howels moved well.

Three days after the operation a slight bloody discharge was noticed on the dressings, one sitch was removed and a small gauze drain inserted into the subcutaneous space. The discharge was tested for urea, but none found.

Five days after the operation a small portion of omentum protruded through the wound The dressings had a urinous odor, and were found to contain considerable urea.

Seven days after the operation a considerable amount of urea was again found in the discharge, as well as a large quantity of albumin

Nine days after the operation a loop of intestine protruded, upon replacing this eight or ten ounces of fluid escaped, which was clear and sticky and had the odor of urine. The intestinal loop was retained by a gauze pad, covered with a strip of adhesive plaster.

The patient died ten days after the operation.

Case 2 Dr J B. Murphy, personal communication Patient was operated originally at forty-two years of age, in October, 1899 He had a history and symptoms of stone in the right kidney. The usual incision in the loin was made and the kidney could not he reached It was found dislocated downward and firmly fixed near the pelvic margin. An anterior incision was then made through the right rectus muscle the Lidney exposed, the anterior peritoneum sutured to the margin of the pelvis, the pelvis opened and two stones extracted The ureter was patent, The kidney was aplastic and only about one-half the normal size Its vessels were not over half an meh in length and were attached to the aorta and vena cava just at the ibac bifurcation A drain was maintained through the anterior abdominal incision for ten days, at which time it was removed, the urine ceased to discharge and the patient recovered

He returned to the höspital on September 6, 1902, with symptoms of recurrence of stone in the kidney, and was then operated by me a second time. We then opened the abdominal wall by a longitudinal incision, seven inches long, one inch to the right of the median line. The posterior pentioneum was divided and the kidney lifted up. The great mesentry was displaced to the left, the kidney was sit uated just above the promonitory of the sacrum, close to the modiline, with vessels not over one-half to three-fourths of an inch in length. The pelvis was dilated Tipping the kidney with its pelvis backward and convex surface forward, the kidney was rotated on its axus, rotating it also to the left until

the dilated pelvis was exposed. The anterior peritoneum was then freed and sutured around the margin of the pelvis. The kidney Itself was about two-thirds its normal size. The pelvis was about two-thirds its normal size. Fixing the personaum firmly to the wall of the pelvis with continuous sutures, the pelvis was opened and a large number of stones could be palapted. The kidney appeared to be considerably larger than it was at the priessary operation.

On March 2, 1904, he came in a third time with similar symptoms. The kidney was again exposed. As it could not be moved now, being fixed to the anterior abdominal wall, a packing was placed around the pelvis. This packing was retained for the days, at which time the kidney was opened and

two small stones removed

He was in the hospital again in November, 1911, but had no symptoms of return of his kidney trouble, and was perfectly well as far as the kidney

was concerned

CASE 3 Dr W H. Allport, personal communication W C N, male aged a8 years Had always been reasonably healthy until one year ago, when he noticed a pain in the left side of his abovemen, low down. As lower the same the he noticed are the same of the same that the same of the left of the spinal column, its upper end at the level of the last lumbar vertebra, its lower end dipping down into the small poliva. This mass is unjet to a him to the small poliva. This mass is unjet to a him can be palpated. The mass is slightly movable.

On March 1, 1917, an exploratory laparetomy was performed through a median uncisson. The mass was recognized as a dystopic kidney. Palpation of the region of the right kidney, with the band as the abdomen, failed to reveal the presence of a right kidney, so toking was done to the left dystopic kidney. After removal of the appendix the incisson

was closed

CASE 4 Dr. A. D. Bevan, personal communication. Operation was performed for supposed stone in the left kidney, the skiagram showing a shadow in this location. No Lidney was found, but a mesenteric gland containing a caleareous deposit was discovered, this accounting for the X-tay shadow.

At autopsy a short ureter was found leading to a pouch about the size of an almoud and containing pus This was undoubtedly a rudimentary pyone-

phrotic dystopic kidney

CASE § Dr. A. D. Bevan (2) Patient, an adult male Four of five years before be had had an exploratory laparoteny. Palpation reveals a timor a little to the right of the median line, just below the umbinicus, tender to pressure. Fattern suffers from severe attacks of paus which last hours suffers from severe attacks of paus which last hours examination disclosed a stone in front of the promotory of the sacrum. The ureters were cathleternets

ized: the catheter that went into the right preter made a short curve about three inches long, while the one in the left ureter went into the entire length of the normal kidney pelvis The X-ray is a hear. tiful example of work of this kind. An X-ray was taken with the catheter in situ. It proved definitely the presence of stone in the misplaced right kidney The duestion was how to remove it, whether a midline incision should be made, and whether the transperitoneal or retroperitoneal route should be adopted. The retroperatoneal route was decided upon and it was simplicity itself. A muscle-splitting incusion, such as we use for an appendix operation. was made, and then enlarged by stretching and with no difficulty at all one could reach, after stripping back the peritoneum and not going into the peritoneal cavity, the pelvis of the kidney. Pyelotomy was made and the stone removed from the pelvis and ureter Dramage was simple. A cigarette drain was inscrited down to the point, no attempt was made to close the opening in the pelvis, because of the considerable depth of the wound and the difficulty of such a procedure. The patient went on to an uninterrupted recovery The kidney was not removed because it seemed to contain a great deal of

normal kidney tissue Case 6 Dr L L. McArthur (14). A man, of middle age, laborer, comes to the hospital with a classical history of right renal colic, harmaturia, purulent urine, no fever. He has passed gravel recently, causing the harmatura for which he enters the hospital The X-ray shows shadow in the renal region, and in the ureter above the illac crest a shadow Segregation shows a normal left urine On operation the calculus was readily found and removed from the lidney. Sounding the ureter from above, in search of second stone, revealed no second stone, but on tracing down the ureter about two inches there was found a branch joining it which would have led one to doubt his anatomy had it not been possible to confirm its identity by the ureteral sound Tracing this lateral branch one soon came upon a small tumor which, on being brought into the wound, proved to be an accessory rudimentary kidnes. In its pelvis could be felt a small calculus This was removed by incision through the pelvis

with immediate suture Recovery uninterrupted. Case 7. Dr. L L McArthur (r4). Babe of fourteen months, suffering for aix days with symptoms that seemed to approximate a partial intestinal obstruction or intussusception. The child had fever, vomiting, great difficulty in securing bowel movement, urine very scanty on diapers. Because of the tumor to be felt in the abdomen I was invited to see the case in consultation. This tumor was in the lower abdomen, in the messal line immediately behind the symphysis, was spheroidal, elastic, tense but fluctuating, and, on bimanual examination, no other conclusion could be drawn but that it was an overdistended bladder, so exactly did it answer all requirements but that of eatheterization. Catheterization showed less than a dram of purulent, al-

I therefore made a tentative buminous urine. diagnosis of suppurating urachus cyst with poor dramage into hladder, and advised operation.

On opening the abdomen, the fluctuating tumor at first glance appeared to he a distended uterus, but close examination proved it to he a cystic kidney congenitally malposed, with a widely dilated ureter of about two inches in length, emptying through a constricted ureteral orifice into the bladder, its vascular supply from the neighboring left iliac vessels. Its walls appearing thin and its contents purulent, a quick nephrectomy was done, with fatal issue within twenty-four hours No post-mortem obtainable. A kidney was to be palpated in the right loin, some urine was excreted during the

remaining hours of hie

CASE S. Dr. L. E. Schmidt and Dr. II. L Kretschmer (21). Mrs S, a very stout woman, giving a history of abdominal pain around the umbilious, associated with occasional attacks of nausea and vomiting. At times pain could be elicited upon deep pressure over the umbilious. An indefinite rounded mass, of solid consistency, could be painated in the median line. In order to exclude a lesion of the kidney, double-sided ureteral catheterization, with fuse-wire catheters, combined with X-ray, was undertaken. On the right side of the catheter can be seen, passing up to the normal posi-tion of the kidney, the end of the catheter passing to the upper horder of the last rib. On the left side the catheter stops at a point corresponding to the lower horder of the third lumbar vertebra straight course of the shadoweraph catheter up to its end leads us to believe that we are dealing with

a congenital dystopic kidney Case o. Dr Aug. Lindemann (13). Man, aged 23 years. Healthy until four days before entering hospital. Vomited several times. Pain in lower abdomen. No fever. Tumor palpable above symphysis; also per rectum. Fluctuating. Numerous leucocytes in urine. White blood count, first day 5,000; second day 10,000 Tumor only slightly

movable

Median incision Laparotomy Tumor found to be retroperstoneal. The posterior peritoneum was cut and a cystic tumor lying on the promontory of the sacrum exposed, which was taken to be a kidney Exploration of the normal kidney regions showed the presence of a normal left kidney and absence of the right kidney. As there was but little normal tissue in the tumor, it was extirpated. The sac contained a large amount of turbid fluid of urinous odor Drainage. Recovery. Discharged from hospital five and one-half weeks after operation

Case 10. Drs. Munro and Goddard (18) Man, aged 23 years. Had had attacks of general abdominal pain, with vomiting and fever. At such times a tumor was palpable in the left lower quadrant of the abdomen. The attacks would last three or four days and disappear when the bowels moved.

Four months before he had headache, fever, malaise, constipation, with dull bearing-down pain in bladder, and was operated upon in a neighboring city, at which time the tumor in the pelvis was drained of a puriform fluid. A sinus remained, discharging a substance resembling vaseline

Dr. Munro enucleated the tumor. The left kidney was palpated and found normal. Later a skiagram showed the right Lidney in normal location. This, then, was a case of pyelonephrosis of a supernumerary kidney. The patient recovered and six months

later was in good health

Case 1r. Dr. John C. Munro (17) Man, aged 48 years. Complained of constinution, constant backache and colicky attacks

Langrotomy The left kidney was in its normal location and normal in structure. No kidney was found in the right loin. The right kidney was located on the promontory of the sacrum a little to the right of the median line, the lower pole being The kidney was somewhat deep in the pelvis lohulated. Nephrectomy was performed. patient recovered and four months later was free from colic and had less hackache.

CASE 12 Dr. A B. Johnson (11) Boy, aged 12 years. The left kidney was located in front of the left sacro-mac joint. Its pelvis contained two ounces of pus. The arteries originated from the internal iliac and the veins emptied into the internal

iliac. Nephrectomy, Recovery, CASE 13 Dr. A B. Johnson (12) Man, twenty Intermittent hydronephrosis Kidney exposed by lumbar route, a quart of bloody urine evacuated. Drainage. After the operation ureters catheterized with styletted catheters and a skingram taken with the catheters in situ, which showed that the catheter in the right ureter crossed the median line of the body to the left side in the mid-lumbar region, so that the upper ends of both catheters lay to the left of the median line.

At a second operation, eighteen months later, it was found that the right Lidney was a rounded mass, two inches in diameter, fused with the lower pole of the left hydronephrotic kidney. The peritoneal cavity was opened and the absence of a kidney on the right side demonstrated. Soon afterward the patient had an anuria of forty-eight hours' duration, and suffered great pain. A small incision was made and the kidney again drained. No stone found. A catheter was left in the wound and clamned.

Case 14. Dr. James W. Henson (9). Man, aged 22 years. There was a history of four or five attacks, each having the following characteristics: More or less rapid onset, acute throbbing pain in the upper part of the left side of the hypogastric region, lasting from three to ten days; pronounced tenderness in the same region, which did not subside for several days after the acute pain was relieved; nausea, which was more pronounced in the first attack and less so in the last; apparently little elevation of temperature and apparently no abnormality in the quantity or quality of urine.

An enlargement or mass was not noticed in the

first attack, but in all the others its presence was

12

early manifested, though it apparently disappeared several days after the subsidence of the more acute symptoms. The first attack, in the autumn of roos. was just after a hearty supper. The patient says that at no subsequent time did there appear to be any relation between diet, drinks or condition of bowels and the attacks Operation was done by the writer May 27, 1000 The mass proved to be a congenitally misplaced kidney lying in the true pelvis, chiefly to the left of the median line. Since we now describe the sigmoid flexure of the colon as reaching to the middle of the sacrum, the kidney lay behind the lower end of this portion of the gut and the upper end of the rectum. To reach the organ the right layer of the sigmoid mesocolon was opened The ureter was necessarily very short The pelvis of the kidney was distended to the capacity of three or four ounces, but there was left a good deal of functionary kidney tissue Periodic obstruction of the ureter, of course, explained the symptoms Nephrectomy was done As at was necessary to drag the kidney upward to get a heature around the vessels, and as the pedicle was very short, the presumption is that the blood supply came from the internal iliac artery.

Case 15 Dr. S. C. Gordon (8). Man Tumor located at brim of pelvis-removed-proved to be kidney. Anuria, death. It is not stated whether the presence of the other kidney was proven

CASE 16 Dr S. C Gordon (8) Woman large and troublesome kidney was removed patient lived twenty-seven days, "although not a drop of urine had been secreted." The autopsy

showed the absence of the other kidney. CASE 17 Dr Thomas S. Cullen (6). O C. J. female, aged 17 years, white. Laparotomy The right kidney was about half as large again as a

normal kidney and completely filled the right half of the pelvis The bladder and rectum were the only other organs in the pelvis. The left kidney was absent. No vagina or uterus was present Both the ovaries were in the inguinal canals Nothing was done to the kidney. Recovery

SPECIMEN NO 1 PLUMMER'S CASE (Fig. 1.)

The left kidney is dystopic; it lies upon the right sacro-iliac joint, the lower two-thirds being in the small pelvis, its upper pole rest ing against the lower pole of the right kidney. It is of normal size and structure, but somewhat misshapen The posterior surface shows a broad groove marking the position where it rested on the sacro-iliac joint. The hilum is directed toward the right. Upon its anterior surface is a deep, narrow groove, passing obliquely from above downward and toward the right, and containing the renal artery and vein. The renal artery arises at the bifurcation of the aorta, being directed at first downward and to the left, then circling toward the right and crossing the entire anterior surface of the kidney to enter the hilum. The ureter passes downward and to the left behind the kidney, opening into the bladder in the normal location on the left side. Its length is about 13 0 cm. This, then, is an example of crossed dystopia without fusion. The suprarenal body is in its normal position. The distance from its lower end to the upper end of the kidney is about 7 5 cm.

The right kidney is of normal shape and normally located. It is larger than an average kidney in all its dimensions; so that its total bulk is almost twice as great as usual. Its structure is normal. Its arterial supply is anomalous. One small vessel arises from the level of the celiac axis, and passes into its anterior surface, near its upper end. A much larger vessel arises from just above the bifurcation of the aorta and passes to the hilum at a level of the junction of the lower and middle thirds of the kidney. One large vein emerges from the hilum and crosses the anterior surface from below upward and inward, emptying into the vena cava. The ureter passes downward, its first 4 cm being imbedded in kidney tissue lying near the anterior surface of the organ. It passes into the bladder in the normal location. Its length is about 18 cm The suprarenal body is in its normal location at the upper end of the kidney.

SPECIMEN NO. 2. (Fig. 2.) Anomaly discovered post-morten Right kidney dystopic. Its exact position in the body is not recorded, but it probably lies partially within the small pelvis. It is a little smaller than an average kidney. The hilum is directed almost upward, but slightly to the right. The artery arises from the bifurcation of the aorta, and divides before reaching the kidney, one branch entering the upper pole of the kidney, the other the hilum, the latter branch being accompanied by the vein toward its termination. The ureter passes across the anterior surface of the kidney and opens into the bladder in the normal position. The suprarenal body is not present in the specimen

The left kidney is not present in the specimen, but was presumably normal. terminal portion of its ureter is present and normal. (Bladder present in specimen, but not shown in drawing.)

SPECIMEN NO. 3. (Fig. 3.)

(In the drawing the specimen is shown as viewed from behind)

Anomaly discovered post-mortem. The left kidney is dystopic. It is located entirely in the small pelvis. It is something more than one-third the size of an average normal kidney. Its hilum is directed upward. One artery arises from the internal iliae just at the bifurcation of the common iliac; it bifurcates before reaching the hilum. Another artery arises from the outer side of the common iliac just at the origin of the external iliac Vein and suprarenal body not shown; only short portion of ureter shown. The right kidney is not present in the specimen, but was presumably normal in size and location

SPECIMEN NO. 4 (Figs. 4 and 5)

Anomaly discovered post-mortem Cause of death, chronic parenchymatous nephritis

(large white kidneys) Right Lidney dystopic. The kidney has nearly twice the bulk of an average kidney. its large size being partly due to its pathological condition. Its length is but a little greater than its breadth, the shape thus approaching the quadrangular Its thickness is a little less than that of a normal kidney The posterior surface shows a shallow depression near its lower third, from which I would judge that the kidney rested on the promontory of the sacrum, its lower third being in the small pelvis. On the anterior surface are two deep transverse furrows, the lower one crossing the entire surface, and the upper one being confined to the middle third. The artery arises from the right common iliac just at its origin from the aorta; it passes outward, across the posterior surface of the kidney, and around its outer border, running in a furrow all the way, entering the kidney in the lower transverse furrow in front. There are two veins, one emptying into the vena cava and accompanying the artery; the other passing up

over the front of the kidney, where it anastomoses with the first vein, and empties into the vena cava in front. The pelvis of the kidney is large and extends vertically from one furrow on the anterior surface to the other, dipping down into each. The bladder is not present, but apparently the ureter is about to cm, shorter than that of the left kidney.

Suprarenal body in normal position: the distance from its lower end to the upper end

of the kidney is about 4 cm.

The left kidney is normal in shape, location and vascularization, but pathologically enlarged: left suprarenal at its upper pole.

In closing, I wish to express my thanks to Dr. I. R Le Count for the use of the specimens from the Museum of the Rush Medical College, and to Drs. I. B. Murphy, W. H. Allport and A. D. Bevan for reports of unpublished cases.

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A NEW TYPE OF ECTOPIC GESTATION - PREGNANCY IN AN ADENOMYOMA UTERI

BY THEODORE O DOEDERLEIN, M. D., AND MAXIMILIAN HERZOG, M. D. CHICAGO

THE fertilized human ovum in normal placentation is implanted into the uterine mucosa When an oyum develops anywhere else except in the utering cayley we speak of an ectopic gestation Even if this occurs, the fertilized ovum. almost without exception, is implanted into a mucosa namely, that of the Fallopian tube. In fact, it was formerly held that a fertilized ovum could only become implanted in a mucosa originally derived from the Mullerian ducts We know to-day however, that this is not true, because a few cases of undoubted primary abdominal and primary ovarian pregnancies have been reported. In cases of these types the ovum must have been implanted either in a serous surface, in a runtured Grankan vesicle, or in a recess of the cerminal epithelium lining the ovary Undoubtedly, a fertilized ovum has very slim chances ever to implant itself anywhere else except into a mucosa, hence the only common form of ectopic gestation is tubal pregnancy, while all others are exceedingly rare. In abnormal uterine gestations, such as pregnancy in a rudimentary horn, interstitial pregnancy, pregnancy in a duplex uterus, etc., the implantation always takes place into mucosa

The three recognized forms of ectopic cestation are therefore (1) primary tubal pregnancy, which may, in consequence of abortion or rupture, lead secondarily to abdominal or intraligamentous gestation, (2) primary abdominal, and (3) primary ovarian gestation.

We want to add to this list a hitherto unknown fourth form of ectonic restation. namely, one in a tumor.

We would a priori expect that such an event, if it occurred at all, could only take place in a tumor containing epithelial glandular structures, and indeed, the ectopic gestation to be here reported occurred in an

adenomyoma of the uterus. An adenomy oma is a distinct variety of the common leiomyoma or fibromyoma of the Tumors of this variety are not exclusively composed of unstriped muscle fibres and ordinary connective tissue, but they contain in addition epithelial glandular structures as an integral part of the neoplastic process. These mixed tumors, first minutely and extensively described by you Reckling. hausen, are known as adenomyomata. They have been the subject of a good deal of discussion and controversy and it is now conceded that their histogenesis is not a uniform one but that they may one their origin to a variety of histologic conditions or causes Von Recklinghausen himself was first of the opinion that the uterine adenomyomata always take their origin from remnants of the Wolflian body or of the Wolffian duct; that is, from embryonic inclusions containing both epithelial and non-striped muscle cells of an early, undeveloped type

The adenomyomata of von Recklinghausen are preferably found in the posterior wall of the corpus uteri, rarely in the cervix, but also in the tubal wall, particularly near the tubal angle. They are generally intramural, they may be near the serosa and rarely they are submucous. They are frequently infiltrating in their growth and not sharply defined from the tissue in which they are situated. In the early cases described by von Recklinghausen, the epithelial portion of these neoplasms in type and arrangement was very much like the excretory glomerular and tuhular structures of the Wolffian body. The first tumors contained closed tubular spaces, composed of a main canal or ampulla, into which emptied numerous smaller canaliculi arranged in parallel rows like the teeth of a comb. The small canaliculi described possessed a free club-shaped or cyst-like extremity which led into tortuous secretory tubules supplied with cubical epithelium. The tortuous tubules emptied into larger canals lined with columnar, partly ciliated, epithelium, and the larger collecting tubules finally emptied into the main canal or ampulla The walls of the glandular spaces here and there showed vascular polypoid projections, so-called pseudoglomeruli. The gland spaces were surrounded by a tissue rich in cells of a young, embryonic type After a number of adenomyomata of the uterus had been encountered and reported by other observers, it was found that the glandular epithelial portions did not always conform to the description first given by von Recklinghausen and that some of these neoplasms evidently took their origin from invaginations or displaced remnants of Muller's duct, others again from glands derived from the uterine mucosa Such glands may either congenitally project abnormally deep into the muscularis or they may penetrate deeply into it in consequence of inflammatory stimuli (glandular hypertrophies) R. Mever who discusses the subject of adenomyoma of the uterus in Veit's Manual of Gynaeology, after a review of the literature, gives five different histologic and histogenetic sources of the glandular portions of the various adenomyomata of the uterus which have been reported, viz, (1) The glandular elements may be derived from the uterine or tubal mucosa, they may be found in the tumor in consequence of a congenital anomaly or displacement, or they may have been carried to the matrix from which the tumor developed

by an inflammatory glandular hypertrophy. (2) The epithelial structures may be derived from the epithelia (endothelia) of the serosa lining the tumor. (3) The adenomatous structures may owe their origin to invaginations or misplaced remnants of the Müllerian duct. (4) or to embryonic inclusions from the Wolflian duct, or finally (5) to embryonie inclusions or remnants of the Wolffian body (urniere). This elassification of uterine adenomyomata according to their histology and histogenesis is largely of academic interest only, because it is generally very difficult and often impossible to form an exact opinion as to the structure from which the epithelial glandular portions of the tumor originate.

The history of the case in which an ectopic gestation occurred in an adenomyoma is as follows:

Mrs K, age 37, had four children, the oldest being fifteen years, the youngest eight years of age Her labors were easy

One year ago she had a miscarriage, having been pregnant two months She had no curettement and bled for one week only After this miscarriage patient never felt well, she had pain in left inguinal region and in back and felt weak generally. A midwife told her at that time she had a tumor She was, however, regular for seven months and able to attend to her household duties. In the eighth month patient had a most profuse menstruation, in fact, a menorthagia Thercafter nationt became pregnant, and her menstruation stayed away for three months In the fourth month, the end of February, the menses reappeared with labor pains She then had bearing down pains and bemorehages almost continuously until the beginning of May A midwife had been in attendance for some time I could not ascertain the line of treatment she pursued. In the beginning of May she called in a physician to make a curettement Bieringer, noticing the unusual state of affairs, inysted me to examine patient at this juncture

On external palpation I found a tumocamas, of tregular ostiline, reaching up to the unabilities. The consistency was firmer than that of a pregnant uterus. Examing patient veginally I could feel the uterus, of about three times its normal size, crowded to the right side by a large tumor. The tumor was fairly firm and could be distinctly outined. The mouth of the worm bas opens of could introduce my fanger uto the uterine cavity and found it empty, at least as far a I could reach up and around the tumor. I now passed a sound with a view to more distinctly explore the fundus and was smazed at the enormous depth the sound passed before it rarehed rock-buttom, passing far beyond the fundus Bearing in mind the possibility of an extrauterine pregnancy, although the consistency of the tumor and the history of the case were against it. I did not dare to make further examination in order to arrive at a positive diagnosis, and advised immediate operation, which, as I fully appreciated, was not devoid of danger owing to the infection of retained placents as indicated by fever and foul-smelling lochia The patient was transferred to the German Hosnital the following day and operated two days after I first saw her

On opening the abdomen by the Pfannenstiehl method, a mass presented in the incision the size of about a four or five months pregnant uterus, everywhere covered with large, tortuous veins delivery from the abdomen the mass proved to be a tumor of fairly hard consistency, situated in the left parametrium, crowding the left tube upward The uterus could be seen as a smaller, softer part of the mass to the right I decided to do a subtotal extirpation for reasons of the nationt's marital relations Soccial care had to be taken to avoid hæmorrhage and especially to avoid infection from cervical canal I made perfect perstonization of internal wound, a small drain being left through cervical stump Although patient had run a temperature of 100 and 101 before operation all I noticed was a slight peritoneal irritation after opera-Otherwise nothing of note occurred during convalescence.

The tumor mass unfortunately was not weighed directly after operation but was of the size of about a four and a half to five months pregnant uterus The uterus, in intimate connection with the tumor.

being about one quarter that size

On opening the uterus through cervit the cavity was found empty Above the internal os an oval orifice admitting the tips of two fingers presented itself Slitting the foramen downward toward the cervix a large cavity within the tumor was brought to view. Attached to the walls of the cavity and almost filling the same was a placenta in good state of preservation, with a few pus foci here and there

Pathologic examination. The specimen removed was examined after it had been fixed and hardened for some time in a four per cent watery formalin solution. If placed in a position similar to that which the mass occupied in situ in the abdomen before operation, its general outlines from right to left are those of an egg-shaped body, the larger pole to the left, while the smaller pole points to the right The greatest circumference from right to left of the whole mass, which has however shrunken considerably in the preserving fluid, is a little less than eighteen inches, and the greatest transverse diameter is a little over seven The mass as a whole is divided inches

externally into a larger left portion and a smaller right one. The division is brought about by a deep gutter-like constriction. which runs around the whole mass from above downward at right angles to the greatest transverse diameter, not exactly in its center but to the right of it. The circumference of the mass in the gutter-like constriction is eleven to twelve inches.

To the left of the constriction is the tumor proper and to the right the enlarged uterus The tumor forms about two-thirds of the mass removed, the enlarged uterus about one-third The greatest circumference of the tumor is from above downward (i e , in a plane with the cephalocaudal diameter) and is about fourteen inches, the greatest diameter of the mass is here a little less than five and one half inches, and four inches from side to side.

The uterus, which is considerably enlarged. bas been severed in the cervix and there is seen at the cut surface an opening, the entrance to the cervical canal The dimen sions of the uterus adherent to the larger tumor mass are as follows: circumference from above downward, twelve inches; greatest diameter from above downward, four and one-half inches: diameter from side to side. three and one-half inches. The anterior portion of the constriction shows remnants of the broad ligament and above is seen the left Fallopian tube with its closed fimbriated extremity attached to the left ovary. This is of rather large size, flattened and shows on section a large corpus luteum, or rather corpus albicans, because the tissues here look gravish white and fibrous and do not show any distinctly vellow color. On the right lateral surface of the uterus are found shreds of tissue, the remnants of the ligaments of the right Fallopian tube and ovary, which had been removed and not preserved with the remainder of the specimen.

After the mass has been laid open in its median plane, parallel with its greatest diameter, it is found that the constriction divides it into a left smaller solid, and a right larger excavated portion, the latter, however, not being empty, but completely filled with a solid mass, which prevents the appearance of a placenta left for some time in the uterine cavity without, however, having undergone This central tissue putrefactive changes. presents the usual picture of a mixture of coagulated, degenerating blood and degenerating villi Shreds of amniotic and chorionic membranes can still be distinctly seen. The placental mass fills the greater portion of the tumor on one side of the constriction, and measures four by three inches on the cut surface. It is still fairly well attached to the tumor wall proper. However, the layers to which it is adherent have somewhat shrunken away from the outermost tumor tissue, and there is a distinct peripheral spherical cleft which separates the placenta and the immediately attached tissues from the outer wall of the tumor

The smaller left (uterine) half of the removed mass is solid with the exception of a small cleft-like cavity, which is continuous with what appears to be the cervical canal There is no large open communication between the placental cavity of the tumor and the uterine cavity; however, there is a slit or canal-like narrow irregular communication which appears to connect the placental cavity with the uterine cavity. This communicating slit is in a position somewhat below what must at one time have been the left tubal angle.

The weight of the whole mass removed, after having been preserved in formalin, is two pounds, five and one half ounces

The specimen even macroscopically showed clearly that it could not be a case of interstitial pregnancy nor pregnancy in a rudimentary horn because the entrance of both tubes into the fundus of the uterus could be clearly recognized Both tubes were also intact and a tubal pregnancy with rupture between the folds of the ligamenta lata could be absolutely excluded

Microscopic examination Pieces for microscopic examination were taken in several places through the whole thickness of the wall of the tumor including the innermost placental and the outermost subserous portions. Such pieces taken through the entire wall were cut into three segments and these were separately embedded and sectioned. Other pieces were taken from the wall of the

uterus proper, next to the uterine cavity, from the upper portion of the cervix, from the canal connecting the tumor and the uterine cavities, from the portion of the uterine wall where Gartner's duct might possibly be found to lead into the canal connecting the uterine and tumor cavities; also from the tube and ovary.

The irregular tissue forming the internal layer next to the cavity is found to be composed of much degenerated blood with fibrin and hæmatoidin granules and crystals. Here are also found fairly numerous villi, some much degenerated, others in a very fair state of preservation. In some villi the Langhans layer is still present; it is absent, however, in the majority of the well preserved villi. It would, therefore, appear that the gestation had gone on to about the middle of pregnancy. when Langhans layer generally disappears The tissue next to the degenerated blood and the villi markedly resembles a decidua compacta. However, the decidual cells are not very typical, though characteristic enough to be recognized as such This tissue resembling a decidua compacta is considerably infiltrated with syncytial masses, some of them having penetrated into the tumor wall for a considerable distance Both the degenerating blood and the tissue to which the villi are attached show considerable leucocytic infiltration, While this marked infiltration clearly points to an inflammatory reaction, bacteria could not be found in these inflammatory foci and they might simply have been due to the presence and absorption of much necrotic material There is no regular decidua spongiosa next to the compacta but there are present cland spaces. These are either quite irregular and large, or they are smaller, and then short pouchy tubular spaces appear arranged around an irregular or oval ampullar space. The gland spaces are lined by rather low cuboidal epithelia. In some places the epithelia are higher and more cylindrical. Distinct cilia could not be demonstrated. Here and there the gland spaces show a few hyaline or colloid spherical masses as they are so frequently and abundantly seen in the decidua spongiosa in normal placentation. The epithelial glands are immediately surrounded by a very cellular



larger half is the tumor, the smaller one the uterus, the left tube and ovary are elevated towards the apex. The night side of the drawing represents what was situated to the left of the uterus in situ in the abdomen.



Far 2 The mass cut open Here the left side of the drawing shows the tumor cavity with remnants of the placenta attached, towards the right the uterine cavity. cervical canal and canal connecting the utenne and the placental jumor cavily

connective tissue The cells are quite embryonal in type and here and there approach decidual cells The muscular tissue is composed of hypertrophied cells and fibers, very irregularly arranged in bundles, and an cedematous condition of the muscularis is generally well marked. Here and there an inflammatory infiltration is seen between the bundles No gland spaces are found in the outermost subserous portion of the tumor wall

The uterine mucosa shows a moderate degree of hypertrophy, the gland spaces are complicated, divided by septæ, on the wbole, rather similar to a decidua spongiosa in a normal uterine pregnancy The interglandular connective tissue shows rather large cells approaching somewhat the type of decidual cells The muscularis of the uterus is composed of hypertrophied cells The degree of hypertrophy of the muscle cells of the uterine wall and those of the tumor wall is about equal An inflammatory infiltration is like wise seen here and there between the bundles of the muscularis of the uterus The cervical canal shows no mucosa but an irregular ragged surface No mucosa is found in the canal connecting the placental cavity of the tumor and the uterine cavity. Pieces taken from portions where Gaertner's duct might possibly lead into the tumor wall do not show any such structure Microscopic examination of the Fallopian tube of the left side shows a mucosa of a fairly normal type: however, some of the connective tissue cells of the folds are markedly enlarged and somewhat of the character of decidual cells. Some inflammatory infiltration is found both in the mucosa and museu laris of the tube However, the mucosa and muscularis are everywhere intact and the microscopic condition excludes the possibility that a rupture of the tube with expulsion of a developing or um into the folds of the broad ligament could have occurred.

Ovarian tissues taken from the site of the corpus albicans show condensation of the ovarian stroma, almost complete absence of follicles, a few small cysts and a large corpus albicans of the usual structure

Epicrisis From the macroscopic and microscopic examination of the specimen, it

Fig 3

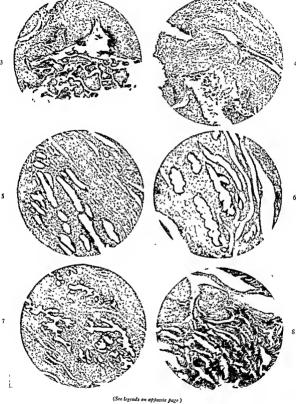
decidual tissue

I as B Hypertrophic, decidua like mucosa of the Placental villa, some penetrating into the us uten

ligs 5-7 Epithelial gland spaces in the tumor walls

I 1gs 3-5 are microphotographs, all taken at a magnifica son of 60 diameters

Fig 4 Decidua compacta infiltrated by syncytial masses



See legends on opposite page | 19

appears that there was pre-ent an adenomyma in the left tubal angle or below it. This tumor, of course, contained glandular spaces, which were probably derived, not from any embryonic inclusions originating from the Wollfan body, but from the uterine mucosa. The gland spaces may have been present in the tumor from the very beginning or they may have entered into its substance at a somewhat later period in consequence of inflammatory processes.

Evidently there was a connection between the uterine mucosa and the gland spaces of the tumor A fertilized ovum, by some unexplainable coincidence, got into the gland spaces of the tumor and there developed. A fairly typical, though quite irregular, decidua was formed, and the growing ovum stimulated the tumor to rapid growth and created for itself a cavity to accommodate the placenta. Pregnancy was interrupted, the embryo died and was expelled in fragments. The latter were forced through the glandular canal connecting the tumor cavity with the uterine cavity. In the removal of the fragments and in subsequent manipulations the mucosa of the connecting canal and cervix were more or less destroed.

HERNIA THROUGH THE PELVIC OUTLET!

By F. F. MONTGOMERY, M. D., Pertabetenta Professor of Intercology, Jefferson Medical College

"III: bony outlet of the pelvis is closed by a musculo-membranous structure which is perforated in the female by three slits, or apertures, for the urethra, vagina, and rectum or anus Within the pelvis are contained the bladder, uterus and its appendages, and the rectum These structures are both suspended and supported They are suspended by the folds of the peritoneum, fascia, the prolongation of involuntary muscular structure of the uterus in the uterosacral and uterovesical ligaments, and by the cardinal ligaments of the bladder. The support is afforded by the pelvic diaphragm or muscular floor of the pelvis, consisting of the levator ani and the peritoneal muscles which unite to form the tendinous structure known as the perineum.

These structures, which both supplement and complement each other, are situated one over the other in the pelvis. The fascia, which envelops and supports the muscles, forms in places strong resisting bands which reinforce the support. The vascular structure, connective tissue and large deposits of fat aid in forming a solid structure which promotes resistance. The disposition to displacement,

or hernia, is still further obviated by the inclination of the pelvis which takes it out of the line of direct or vertical intra-abdominal pressure. The relative positions of the uterus and vagina are also of importance as line of vertical pressure on the posterior uterine surface is deflected against the most resisting portion of the pelvic floor, the tendin-

ous perincum This brief resume of the forces which combine to support the pelvic contents makes it exident that deviation from the normal inclination of the pelvis, or position of the uterus, injuries to the pelvic floor, relaxation of its muscular structure, overstretching of its fascia, loss of adipose or muscular tone, will conspire to the production of displacements and thus promote hernia. There are two points which may be considered weak in the normal construction. The first is in front at the base of the bladder between the tendinous arches, and the other, posterior in the space between the uterosacral ligaments and the muscular structure.

The disposition to protrusion at these points of material weakness is aggravated by the injuries incident to parturition, especially



Fig r Urethral herma or prolapse of the urethral mucosa

the loss of support associated with extensive laceration or muscular atrophy, by increased weight of the pelvic structures, or by exaggerated intra-abdominal pressure The latter may be continuous, when produced by intraabdominal growths or inordinate fatty deposits in the omentum and mesentery, transitory, from injudicious pressure of clothing, straining at stool, and severe exertion. Loss of support from extensive laceration, or loss of muscular tone associated with emaciation. especially following the climacteric, are likewise prone to cause downward displacement When these forces are continued, as in retrodisplacement of the uterus, lessened inclination of the pelvis with decreased support, or increased intra-abdominal pressure, the inclination to protrusion is exaggerated

Varieties. These hernial protrusions may be divided into urethral, preuterine, uterine, postuterine, and rectal or anal. Two or more of these forms may be combined.

Urethral hernia may be either a prolapsus of the urethral canal or a protrusion of the mucosa (Fig. 1) and wall of the body of the



lig 2 Vertical section of Fig 1

bladder The protruding portion may be either so gripped or constricted by the urethra as to cause it to be ædematous, or even strangulated Hernia consists of the mucosa and may involve one side of the canal or its entire circumference (Fig 2)

Preuterine hernia in olves the bladder, and may be a sliding off from the symphyses, or the suspensory ligament may hold, and the base of the bladder drag. Such a condition is called a cystocele and may be associated with a prolapsus of the uterus, or where the body of the latter retains its place the cervix may become elongated. It is a frequent form of protrusion and soon results in a portion of the bladder being situated at a lower level than the inner orifice of the urethra. The resulting cystitis with its tenesmus increases the protrusion.

Ulerine hernia is a protrusion of the uterus which as it comes down is covered with the vagina, but the lower portion of the vagina remains fixed. The eversion of the vagina iform above and the condition is known as uterovaginal prolapse.

Postuterine hernia is most frequently asso-

ciated with laceration or overstretching of the perineum and may consist of a protrusion of



Fig ? Rectum attached to the posterior parietal peritoneum at A and to the cervical B, while the peritoneal surfaces laterally are sutured to close the retrouterine pouch below

chanical measures, pessaries, served a very useful purpose, the usefulness of which, at the present day, is too frequently overlooked It is essential that the displaced structure should be readily replaceable, the cervix healthy, and the pelvic floor so in evidence that it will alford the necessary support for the instrument When the pelvic floor is lost the only relief by mechanical measures is the employment of a pessary with external support, but it irritates the vulva, causes pressure ulcerations in the vagina and on the cervix so that neither physician nor patient finds it agreeable and satisfactory.

The surgical measures are designed with three aims in view first, to decrease the weight of the uterus, second, to combat the intra-abdominal pressure, and, third, to afford additional support. These aims may be accomplished by such slight measures as amputation of the cervix, and the simpler plastic procedures upon the anterior and posterior segments of the pelvic floor, or may require very extensive dissection and realimment of the pelvic structures. The her-



Fig 8 Dotted line showing attachment of anterior parietal perstoneum over the fundus, which was fixed in the anterior abdomical wall

nia of the anterior vaginal wall and the bladder affords one of the most serious problems. The principal methods for combating this condition are those devised by Goffe, Watkins, and Dudley

Goffe made a transverse or semilunar incision over the cervix, and from this, to near the external meatus, a vertical through the vaginal wall, separated the bladder from the vagina, in front of the cervix, and the anterior surface of the broad ligaments Where, as was not uncommon, the uterus was retroverted, he secured a loop of each round ligament in front of the uterus, closed the peritoneum and stitched the bladder to the anterior surface of the fundus uteri and to the summit of each broad ligament

After a similar dissection, Watkins drew down the fundus uteri, sutured the vesical layer of the peritoneum to its posterior surface, then sutured through the edges of the vaginal dissection and the anterior surface of the fundus so that the uterus subsequently occupied a position between the vagina and the bladder. This operation in Continental Europe is called the Schauta-Wertheim operation, or vesicovaginal interposition. The redundant vaginal wall is resected before it is closed over the uterus.

This operation is applicable only to the sterile or artificially sterilized woman. Where the body of the uterus is large, or the cervix is long, it subsequently projects upward and backward, and thus favors the formation of a sacculated condition of the bladder in front of the fundus which endangers incontinence. This condition may be obviated in the one case by removing the large fundus, as suggested by Pfannenstiel After the vesical peritoneum has been sutured to the posterior uterine surface at the level of the junction of the cervix and body, a keel-shaped amputation is made of the body, and the stump is secured beneath the contracted vaginal flaps When the cervix is long, an amputation should precede the interposition of the uterus. After repeated operations, according to the plans suggested by Goffe and Watkins, I am more inclined to favor that suggested by Dudley for the amoutated cervix. Swung on the lower sections of the broad ligaments, the lower end of the uterus is so raised that the fundus is thrown forward None of these operative procedures is complete, however, without being supplemented by rectovaginal interposition of the levator ani muscles, a procedure which I have followed for the last six years and which has been described by Barrett, and has been especially emphasized lately by the work of Tandler and Halban The procedure consists of raising a flap from the posterior segment of the pelvic floor by an incision around the posterior margin of the vulvar outlet from the remains of one caruncle myrtiform to the one on the opposite side. After the cicatricial tissue is cut through, the structures are separated by blunt dissection with the gauze wrapped finger. In marked cases the exposure should extend to the level of the spine of the ischii which will frequently require that the peritoneal floor of Douglas' pouch should be separated for a considerable distance. The edges of the levator ani muscle are united with continuous or interrupted catgut sutures. After these sutures are introduced and tied, the superficial tissues are

brought together with a row of sutures, the upper one of which is inserted at the left angle of the incision, carried across beneath the margin of the flap and brought out on the opposite side. This suture used as a tractor, others are inserted below it, making sure that the under surface of the vaginal flap is included in order to insure obliteration of dead spaces. Where the separation of the peritoneum is neglected it not infrequently constitutes a hernia which can protrude from the vulva over a well-interposed union of the levator ani muscles. This is particularly true in women who have passed the climacteric. are increasing in flesh and making strenuous efforts to maintain the same waist and hip measurements

The operative procedure designated ensures a firm support and will in the majority of cases render unnecessary the opening of the abdomen for anchoring the uterus forward. In marked relayation, however, the unanchored utcrus is driven like a wedge through the newly constructed pelvic floor and should be maintained forward by the shortening of the round ligaments, and when the uterus shows a disposition to drag on its anchorage, by quilting together the peritoneum posteriorly, and thus shutting off the Douglas' pouch and at the same time raising up and holding back the cervix. Such a procedure places the uterus across the pelvic brim and utilizes it to control exit from the outlet

In women who have passed the climacteric the uterus has become completely prolapsed, and the cervix and protruding vagina present extensive gravity sores, therefore, the operation of extirpation should be considered the procedure of election. The cervix should be drawn on with fixation forceps and an incision extended over the front of the vagina just posterior to the urethra, around the cervix, hugging the latter closely posteriorly. The bladder should be pushed back, the peritoneum opened in front, the broad ligaments ligated to secure the uterine and ovarian arteries. Following the removal of the uterus, the vesical peritoneum should be united with a continuous chromic catgut suture from side to side, making the line of suture vertical,



Fig 3 Rectal hernia consisting of prolapse of lower portion of bowel

the anterior rectal wall through a diastass of the structures, or of a dissection between the vagina and rectum in which the perstoneum is pushed downward, and the sac with the interior that the production the protression of the vagna is known as a rectocele when the anterior and posterior walls of the vagina thus roll out and become thickened, they drag upon the cervix, and a complete eversion of the vagina accompanied by the uterus, may occur, or where the fundus is fixed a hypertrophic elongation of the cervix may be caused. This form of hemia is generally denominated vaginouterine prolapse

Rectal herms involves the anal outlet and me an eversion of the lower division of the rectum with the anus (Fig. 3), or that part of the rectum attached to and below the peritoneum may hold its place while the hernial protrusion is an invagination of the upper part of the rectum and sigmoid, or even of the descending colon (Fig. 4)

Diagnosis The inspection of the pelvic outlet in the majority of the conditions named will be sufficient to differentiate the forms of hernia The tubular projection of the urethra with its central opening continuous with the external meatus distinguishes it from the less frequent protrusion of the bladder wall. The red or purplish exdematous protrusion misleads those stering such conditions for the first time into the belief that it betokens malignancy, but careful consideration shows that it is due to the constriction. One such case came to me with the statement that a surgeon in charge of one of the state hospitals had refused to operate because he regarded it as maliemant.

Inspection only is sufficient to differentiate cystocele and rectocele. In the vaginouterine prolapse the vagina is everted; in the uterovaginal the finger can be passed into the vacina around the protruding mass Such a condition can be differentiated from infravaginal elongation of the cervix, or pseudoprolapsus, by the relation of the vagina, and especially of the bladder to the protrusion. In complete eversion of the vagina it is desirable to determine whether procidentia is an accompaniment, which can be determined by grasping the protrusion with the hand, when, if procidentia, the uterus will be in the grasp of the hand, while in supravaginal clongation of the cervix the round cord formed by the cervix will be felt to rotate between the thumb and finger. The extent and cause of the rectocele can be



Fig 4 Invagination of rectum and sigmoid through anus and lower bowel, which remains intact

determined by hooking forward the finger introduced into the rectum.

Rectal hernia, when affecting the lower end of the bowel, is seen continuous with the anus and forms a wide protrusion, generally some what flattened, although! I have seen such a condition which projected for over six inches Intussusception may cause a tumor projecting for several inches from the anus resembling a polypus, the pedicle of which is constricted by the anal sphincter Examination will disclose that the lower end of the bowel retains its normal relation

Treatment No class of surgical cases offers more serious problems in their correction than are experienced in the treatment of the various forms of hernia through the pelvie outlet. The existence of many of these conditions indicates extensive changes in structure and relations which it is beyond possibility to restore again to normal conditions and environment. In urethral prolapse it would be folly to attempt to reduce the protrusion, for it would soon be reproduced.

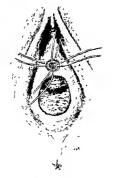


Fig 5 Prolapsed urethra excised and sutures introduced to unite the mucosa to the meature

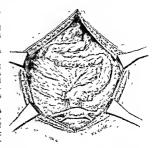


Fig 6 Rectum anchored by its mesorectum to the posterior parietal peritoneum, the sigmoid loosened and reattached below the cæcum, while the intestine is sutured as it crosses and recrosses the pelvic brim

both the cases coming under my observation, I have severed the mucosa at the external orifice, and after drawing out the protrusion have cut it off and sutured the cut surfaces (Fig 5) When the urethral oritogether fice is enlarged it can be narrowed by removing a triangular section of the anterior margin of the outlet and suture this transversely, thus lessening the tendency to recurrence external orifice then becomes the narrowest part and supports the column above hernia of the bladder wall, the urethral canal is without question relaxed. The canal may be narrowed by a plastic operation on the ragina which compresses the urethra, but the necessity to evacuate the urine renders it difficult to provide against recurrence by mere tightening up the onfice It may be necessary to secure the bladder wall higher on the surface of the uterus, or anchor it in front through an abdominal incision

In the heraia through the middle orifice of the pelvic floor, the vagina, the problem of relief is frequently complex When I came upon the professional stage, mechanical means were the only resource and all sorts of pessaries were devised When there had not been too great loss of pelvic floor these me-





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The surgical measures are designed with three aims in view first, to decrease the weight of the uterus, second, to combat the intra-abdominal pressure, and, third, to afford additional support. These aims may be accomplished by such slight measures as amputation of the cervix, and the simpler plastic procedures upon the anterior and posterior segments of the pelvic floor, or may require very extensive dissection and realignment of the pelvic stuctures. The herilagment of the pelvic stuctures.

nia of the anterior vaginal wall and the bladder affords one of the most serious problems. The principal methods for combating this condition are those devised by Goffe Watkins, and Dudley

Goffe made a transverse or semilunar incision over the cervix, and from this, to near the external meatus, a vertical through the vaginal wall, separated the bladder from the vagina, in front of the cervix, and the anterior surface of the broad ligaments. Where, as was not uncommon, the uterus was retrovered, the secured a loop of each round ligament of the total properties of the perioneum and stitched the bladder to the anterior surface of the fundus uteri and to the summit of each broad ligament.

After a similar dissection, Watkins drew down the fundus uteri, sutured the veical layer of the peritoneum to its po-terior surface, then sutured through the edges of the vaginal dissection and the anterior surface of the fundus so that the uterus subsequently occupied a position between the vagina and the bladder. This operation in Continental Europe is called the Schauta-Wertheim operation, or vesicovaginal interposition. The redundant vaginal wall is resected before it is closed over the uterus.

This operation is applicable only to the sterile or artificially sterilized woman. Where the body of the uterus is large, or the cervix is long, it subsequently projects upward and backward, and thus favors the formation of a sacculated condition of the bladder in front of the fundus which endangers incontinence. This condition may be obviated in the one case by removing the large fundus, as suggested by Pfannenstiel. After the vesical peritoneum has been sutured to the posterior uterine surface at the level of the junction of the cervix and body, a keel-shaped amputation is made of the body, and the stump is secured beneath the contracted vaginal flaps. When the cervix is long, an amputation should precede the interposition of the uterus. After repeated operations, according to the plans suggested by Goffe and Watkins, I am more inclined to favor that suggested by Dudley for the amputated cervix. Swung on the lower sections of the broad ligaments, the lower end of the uterus is so raised that the fundus is thrown forward. None of these operative procedures is complete, however, without being supplemented by rectovaginal interposition of the levator ani muscles, a procedure which I have followed for the last six years and which has been described by Barrett, and has been especially emphasized lately by the work of Tandler and Halban. The procedure consists of raising a flap from the posterior segment of the pelvic floor by an incision around the posterior margin of the vulvar outlet from the remains of one caruncle myrtiform to the one on the opposite side. After the cleatricial tissue is cut through, the structures are separated by blunt dissection with the gauze wrapped finger. In marked cases the exposure should extend to the level of the spine of the ischii which will frequently require that the peritoneal floor of Douglas' pouch should be separated for a considerable distance. The edges of the levator ani muscle are united with continuous or interrupted catgut sutures. After these sutures are introduced and tied, the superficial tissues are

brought together with a row of sutures, the upper one of which is inserted at the left angle of the incision, carried across beneath the margin of the flap and brought out on the opposite side. This suture used as a tractor, others are inserted below it, making sure that the under surface of the vaginal flap is included in order to insure obliteration of dead spaces. Where the separation of the peritoneum is neglected it not infrequently constitutes a hernia which can protrude from the vulva over a well-interposed union of the levator ani muscles This is particularly true in women who have passed the climacteric, are increasing in flesh and making strenuous efforts to maintain the same waist and hin measurements

The operative procedure designated ensures a firm support and will in the majority of cases render unnecessary the opening of the abdomen for anchoring the uterus forward. In marked relaxation, however, the unanchored uterus is driven like a wedge through the newly constructed pelvic floor and should be maintained forward by the shortening of the round ligaments, and when the uterus shows a disposition to drag on its anchorage, by quilting together the peritoneum posteriorly, and thus shutting off the Douglas' pouch and at the same time raising up and holding back the cervix. Such a procedure places the uterus across the pelvic brim and utilizes it to control exit from the outlet.

In women who have passed the climacteric the uterus has become completely prolapsed, and the cervix and protruding vagina present extensive gravity sores, therefore, the operation of extirpation should be considered the procedure of election. The cervix should be drawn on with fixation forceps and an incision extended over the front of the vagina just posterior to the urethra, around the cervix, hugging the latter closely posteriorly. The bladder should be pushed back, the peritoneum opened in front, the broad ligaments ligated to secure the uterine and ovarian arteries. Following the removal of the uterus, the vesical peritoneum should be united with a continuous chromic catgut suture from side to side, making the line of suture vertical.

The inner or peritoneal surfaces of the broad ligaments are united with the same suture, exercising care that it raises up the prolapsed bladder, and the suturing is continued until the entire peritoneal wound is closed. The ends of the broad ligament stumps are made to approximate or overlap each other in the median line and particularly beneath the demuded bladder. The edges of the vaginal mucosa can then be inited on a transverse line in the vaginal fundus, and by a vertical one in the anterior wall. This procedure should be supplemented by the rectovaginal interposition of the united levator an inwelse.

The rectovagual interposition of the uterus has been suggested for the correction or control of rectocele but the necessary disturbance of the circulation and the nerve distribution, together with the weight of the organ associated, has made it seem to me an

improper procedure

The correction and prevention of hernia through the anal outlet present serious prob-One's first inclination is to consider it an indication of weakness of the solvineter. which should be made to stand more rigidly on guard, but the futility of this is appreciated when we consider that the function of this muscle is to relax and to facilitate the expulsion of any material coming against it, and no nower to differentiate as to the character of the material is afforded it It is true that a weakened sphincter may favor a hernia of the rectal mucosa and may consequently require to be tightened as a part of the procedure, but the chief aim should be that the bowel should not impinge against it The operative procedures are necessarily divided into extraabdominal and intra-abdominal, according to the situation of the hernial protrusion, whether of the lower end of the bowel or an invagination of the rectum or sigmoid

In the first class where there is a redundant or prolapsed portion, a collar can be amputated and the edges sutured together something like an exaggerated Whitehead operation, but this has always seemed to me to endanger the sacrifice of the sphineter muscles. The sphineter is generally overstretched and no longer exerts a restraining influence on the contents of the canal. I have seen two cases

in which the eversion involved the lower part of the intestine, but in the first it was associated with an extensive prolapse of the rectum, so that the woman, a large fleshy person, sitting with either buttock on a chair and straining the bowel would form a tumor six inches long. A triangular section was removed from the anterior wall and a considerable section from the subineter. The bowel was united with a double row of transverse sutures and the ends of the retracted sphincter united. The abdomen was opened, the intestine drawn un and sutured by a number of sutures to the side of the abdomen and to the abdominal incision. This patient was entirely relieved for a number of years but there was ultimately a recurrence, though to nothing like the former

The second was a woman, aged 30, mother of six children in five pregnancies, who was twice operated on for laceration of the pelvic floor, by the late Dr Joseph Price. When I saw her the effort of straining would evert the bowel, forming a projection about four inches in diameter This projection would occur when much upon her feet, and, as she attended a small store, it was a source of continual distress Tebruary 10, 1010, at the Jefferson Ilo-pital, I cut through the vaginal septum into the rectum and removed a section of the anterior wall of the rectum extending some three inches up the canal, but instead of excising a scetion of the sphincter I overlapped its ends In addition the cervix was amputated, the anterior vaginal wall split and retracted, pushing back the bladder and anchoring it higher on the uterus A rectovaginal interposition of the levator and was made. The abdomen was opened, the round ligaments anchored to the abdominal wall, the rectum drawn up and anchored on either side of the pelvis, and in closing the abdominal incision the uterus was sutured by its anterior surface which held it well out of the nelvis.

In February of the present year, two years later, she again entered the hospital complaining of a sensation as of the re-formation of a rectocele. The sphineter control was perfect, while she had none previously. There was no disposition to rectal protrusion but it was all confined to the nostuterine structures

of the vagina. The vagina and perineum were opened to the sphincter, a projecting pouch of the peritoneum pushed back, and the levator ani muscles exposed and isolated at a higher level, when they were sutured in the middle line and covered by superficial sutures, which closed the exterior portion of the wound in the vagina and perineum.

In the second class of cases, where the lower two or three inches of the bowel retains its position, but an invagination of the sigmoid, or even colon, takes place through the anus, it would be useless to confine the operative procedure to the narrowing of the sphincter. Amputation of the bernial projection through the anus would be both ineffective and unsatisfactory. The removal of the prolapsed part from below would be almost impossible and the occurrence of a stricture would be endangered. Unless the anus has been overstretched it should not be disturbed, but the operative procedure should be an abdominal one. The intestine can be drawn up and the slack portion excised, or a lateral anastomosis may be done as suggested and practiced by McArthur of Chicago.

The resection of the intestines endangers the occurrence of a structure at the site of the union while the anastomosis, unless the affected intestine is anchored, endangers its becoming dragged upon by the heavy loop

The following history of one of my patients illustrates a method of procedure which may be employed in whole or in part in such cases.

Mis F, aged 37 years, the wife of a physican and the mother of two children, a strong, rugged woman, had suffered for several years from a protrusion of the bowel which obliged her to complete the act of defectation with the aid of a finger. When I examined her I found that the protrusion was an invagination which began at the point of insertion of the performent over the bowel, what the herma projected four inches from the aims. The aims, when the tumor was replaced, was sufficiently light to fixed point of the distal end was too high to permit fixed point of the distal end was too high to permit of teady access for operative procedure from below

While it is true that by splitting the anterior wall of the rectum through the splinder into the vagina it would have been possible to have amputated the protruding mass, the soling and infection of the pertoneal cavity would have been difficult to obvite, and besides the possibility of a stricture at the arte of this amputation and the risk of imperfect condition of the attestine above, made me feel it was waser to leave intact the pelvic floor, and open the abdome.

On the 18th of December, at St Agnes' Ifospital, a median abdominal incision was made, when it was found there was a long mesorectum and a deep retrouterine pouch Passing the finger behind the uterus the rectum could be readily invaginated through the fixed portion at the bottom of this pouch, the rectum sigmoid and colon were loosely The rectum was attached by the peritoneal fold drawn up, its peritoneal surfaces incised on either side as far back as could be done without endangering its vascular supply, the peritoneum spread out and sutured on each side to the posterior parietal perstoneum (Fig 6), thus anchoring the rectum The anterior surface of the rectum was sutured to the posterior surface of the cervix and the peritoneum on either side quilted together in such a way as to form a peritoneal floor and close the lower part of Douglas' pouch (Fig 7) The intestine above this was so extensively convoluted as to make it a question how to dispose of the loop in such a way as to obviate the danger of fæcal accumulation within The peritoneum on the outer side of the sigmoid was incised and the loop of intestine thus freed carried across and fastened beneath the end of the cæcum on the right side The lower margin of this loop was sutured by catgut at several points as it thus passed across the brim of the pelvis. The upper portion of the loop was sutured to the base of the mesentery, and the intestines and omentum dropped over the loop. The appendix was re-moved. To insure still further security against prolapsus, after cutting the Fallopian tubes and suturing the uterine cornua to insure subsequent sternization, the parietal peritoneum in closing the abdomen was carried around, sutured to the sides of the uterus, and the fundus brought up between the recti (Fig. 8), and secured to the under surface of the aponeurotic layer of the abdominal wall

Adde from severe nausea for forty-eight hours following the operation, the patient experienced no unlavorable symptoms. She suffers less from constipation than prior to the operation, has experienced no inconvenience from the operative procedure, and is free from all symptoms associated with the former unwagnation.

OVARIAN TUMORS COMPLICATING PREGNANCY, DELIVERY, AND THE PHERPERIUM¹

BY CHANNING W. BARREIT, M D. CHICAGO

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THE well-known discomforts, dangers. nutritional disturbances, and psychologic changes due to either premance or the ovarian tumor are greatly augmented when the two conditions are coinci-

The position of surgical treatment for ovarian tumors alone is established, but obstetrical conservatism on the one hand and surgical aggressiveness on the other still leave the treatment of ovarian tumors during pregnancy, delivery and the puerperium an unsettled question. There has been, and still is such variation of opinion that it has seemed not unwise to present a paper which will clicit an opinion from this society composed as it is, of surgeons interested in obsternes, and obstetricians interested in pelvic surgery, for the guidance of the occasional operator

Surgery of pregnancy is in the developmental stage. It has been hampered by many preconceived and erroneous notions. some of which are

That the life of the child in utero has relatively little value

That, when pregnancy is found complicated by pathology, the easiest and safest way to simplify matters is to terminate preg-

nancy That patients do not stand operations

well during pregnancy That following operative procedure, abortions are to be expected

That if pregnancy continues the child will be "marked "

More consideration is at present being given the child in utero by sociologists and obstetricians We are more and more coming to believe that the child has rights a little more nearly on a par with the mother, and that, if the presence of pathology and the growth of the ovum clash, the pathology and not the ovum should be removed or, if the removal of a growth would sacrifice the oyum. the growth should remain if it add only slightly to the mother's risk. Abortions have too frequently been performed for conditions which at the worst would only result in abortion The child having rights, we should. in the presence of pregnancy complicated by a tumor, remember that we have two patients with one tumor rather than one patient with two tumors, not what is the easiest way to simplify a complex situation, but how best to

do it to save both fives. It is understood that a percentage of cases develop such complications during pregnancy that relief is imperative, but a considerable number of cases are seen at a time in which no symptoms force immediate action It would seem proper that the discussion from this society, as well as evidence from the collected cases, should combine with statistics at hand to answer as far as possible the following questions.

Shall the ovarian tumor, discovered during pregnancy, be removed even though symptoms be absent, or only slight, or does obstetric conservatism demand the expectant plan of treatment?

Do the complications of delivery and the puerperium in the presence of ovarian tumor warrant an expectant plan of treatment?

Is there a certain period of pregnancy most favorable for operative procedure, for which we should wait, or which, if past, should compel the patient to go to term?

Which more greatly predisposes to abortion—the remotal of an ovarian tumor,

or its presence! Does the removal of double ovarian

tumor necessarily result in abortion?

6 Should the abdominal or vaginal route be chosen for removal?

7. Does tapping, puncture, or induced abortion relieve a complicated situation sufficiently to warrant such procedure?

In order that our conclusions may not represent opinions only, we have collected a series of one hundred and fourteen recent cases of ovarian tumors complicating pregnancy, labor and puerperium, including five cases seen personally, the results of which speak very decisively in answer to some of the im-

portant questions above. In this series of one hundred and fourteen cases, seventy-six were operated on for removal of the tumor during pregnancy previous to full term Of these seventy-six cases, seventy-three mothers recovered; one of those dving being the case of Ribbius, in which an exploratory puncture, without effecting the removal of the tumor, was made through the vagina in the sixth month of pregnancy, six days later laparotomy was performed, because of peritoneal symptoms, but the patient died from peritoneal infection the second case, the one of Clemenz, hæmorrhage occurred from the stump after the removal of a pedunculated tumor, a dead foctus was removed the following day days after the operation an abscess of the parotid was opened and two days later death occurred The third case, reported by Lobenstine, was operated upon in the sixth month of pregnancy, a laparotomy was performed and the feetus extracted in a severe case of sarcomatosis, the patient dying three months

after the operation It will be seen then, that in this series of seventy-six cases operated upon during pregnancy only one death of the mother occurred after an elected colliotomy with removal of the tumor, this being the case of Clemenz. which suffered an accidental hæmorrhage with subsequent abortion, infection and pyamia Of the seventy-three cases that lived, sixtythree went to term One case, that of Lehmann, had a hysterectomy, pregnancy not being suspected. This leaves only nine cases of abortion or premature delivery following single or double ovariotomy in seventy-three cases, and that notwithstanding the fact that many cases had torsion, infection, incarceration, etc., so that not infrequently the abor-

tion was merely the result of damage previously inflicted. We must decide for or against immediate operation, however, not alone by the results of the immediate operation, but by the results obtained by the exnectant treatment. Of our series of one hundred and fourteen cases, thirty-eight cases were unoperated before term.

- mother died before term (Kelly)
- 7 mothers were lost at term
- 7 children lost (1 pair of twins). 6 Casarean sections were performed (2 mothers died, a pair twins died)
 - 7 cases no operation (4 mothers died). 7 vaginal ovariotomies (1 mother died, 1 child
 - vaginal nunctures (1 mother died)
 - 6 abdominal ovariotomies during labor
 - 3 abdominal evariotomies during puerperium 5 cases were operated in which route of operation is not mentioned
 - r craniotomy

The results shown in the cases dealt with at term give overwhelming evidence in favor of dealing with the tumor before labor sets

This shows a maternal death rate of 18 4 per cent as compared with 26 per cent in cases operated before term, leaving out the case that died from sarcoma, and even this small percentage is accounted for by an accidental hamorrhage and an ill-advised method of operation, viz. vaginal puncture

It cannot be claimed in justification of the greater mortality at term, that the most complicated cases were included in this list, for it would be the least complicated cases that would not demand earlier attention. Very slight difference is shown in the feetal mortality, but here again the waiting treatment is more at fault than is at first apparent, for in several instances the expectant treatment resulted in such damage that abortion followed an operation during pregnancy. Add to this high maternal and foetal mortality of the expectant treatment, the fact that only seven of the thirty-eight cases escaped operation, and that four of those seven died and the remaining three still have the tumor with which to contend, and it would seem that there is little to recommend this form of treatment.

A study of our series as to the time of the operation, reveals the following:

Forty-four cases are recorded operated during first half of pregnancy, three abortions,

no death of mother.

Eighteen cases are recorded operated during second half of pregnancy, four abortions, death of three mothers.

Fourteen cases, time not recorded, two abortions, no death of mother.

This would indicate again the advisability of early operation, the expectant treatment being responsible for the pooter results during the latter half of pregnancy. The results during the latter half, however, are so far superior to results at term, as to warrant re-

moval of the tumor during this period A study of the cases of double ovarian tumor shows that out of eight double ovarian tumor shows that out of eight double ovarian totomics six went to term, this evidence contradicting the opinion that pregnancy cannot continue without corpus luteum The slightly higher rate of abortion in double ovariot omics in our scries, as well as in that of others, leaves us in doubt as to whether the presence of ovarian tissue has a beneficial influence upon pregnancy, or whether the increased injury incident to the presence of two tumors, and then the removal of two, does not account for this increased erecentage of abortion.

for this increased percentage of abortion.

My personal experience with ovarian tumors during pregnancy is limited to five cases

CASE: Mrs R, seen in the P & S College clinic Patient brought in in collapse from rupture of pelvic tumor Pregnancy not diagnosed before operation, but suspected at time of intra-abdominal examination. Fluid and sac of left ovarian tumor removed. Pregnancy went to term

Case 2 Mrs W Multipara, had won pessary after bith of last child for retrosplacement Patent preparat 2½ months, and presenting symptoms of uncarcation with threatened abortion Binanaial examination revealed tender, uncarcated, pregnant uterus and left ovariant tumor Abdominal operation was done, the cyst and sac with full water removed, the uterus freed, and the round ligaments shortened Pregnancy continued to term

CASE 3 Mrs S Multipara History of tumor complicating last childburth and puerperum, but which had given little trouble since, until list two months Examination revealed a two-fiel stated mass in the pelvis, closely attached to the uterus which organ was crowled upward and to the left Abdomnial operation revealed infractive extension of the control o

the tumor. Abdomen closed with wick drainage, which was removed in 36 hours, as recovery was without rise in temperature. Pregnancy continued to term, and patient when last seen was again pregnant.

CASE 4 Mrs S. Multipara; 41/2 months preg-Gives history of mass felt for four or five years, but giving no trouble. Hard working woman. was helping busband to unload a carload of coal. when severe pain came on. When seen several days later, patient anxious in appearance and extremely sick, but with moderate temperature A large, firm mass was felt in upper left quadrant of the abdomen. Bowels greatly distended with gas, Pregnant uterus occupying lower part of abdomen. Ovarian tumor with twisted pedicle complicating pregnancy and with secondary peritoritis was diagnosed. Operation revealed free fluid, bowels distended and markedly injected Tumor gray-blue-black in appearance and pedicie with complete twist. Tumor size of a head, easily removed without puncture. Abdomen closed with drainage Recovery uninterrupted, pregnancy going to term.

rupces, pregnitury going to term.

Sen in consultation with Dr. Stelle. Patheat greatly emadated and reduced in strength, but pretenting great
distantion of the abdomen. Large ovarian tumor
with pregnatory 6 to 7 months diagnosed and operation advised, which was done by Dr. Stelle assisted
by Dr. Davison. Premature delivery followed
by Dr. Davison. Premature devery followed
undoubtledfy due to previous compression.

The results shown in our series are substantiated by the statistics of others as fol-

lows Patton collected ninety-five cases treated expectantly, thirty-one cases treated by puncture, and one hundred and eighty four cases treated by abdominal section The ninetyfive cases treated expectantly, for fear of interrupting pregnancy, resulted in twentyfive maternal deaths, four of which were in cases operated on after labor, and twenty-one not operated on at any time Twisted pedicle was observed twenty-nine times, four before labor and twenty-five during the puerperium. Rupture of cysts occurred in thirteen instances, three before and ten during or after labor Suppuration was observed six times during the puerperium Pregnancy was interrupted in 180 per cent of the cases. Mortality in cases not operated on at all, 45.6 per cent, mortality in cases operated on after delivery, 8 1 per cent Patton's cases treated by puncture or tapping showed a maternal mortality of 18.7 per cent, and

interruption of pregnancy in 54.8 per cent of cases. His one hundred and eighty-four cases treated by abdominal section showed one hundred and seventy-six recoveries with eight deaths, a mortality of only 4.3 per cent in spite of the fact that forty-six cases had twisted pedicle and some of them were in desperate condition. Interruption of pregnancy occurred in 19 per cent of the cases, which may be charged largely to complications. His 18.9 per cent of interruptions in cases treated expectantly, leaves the other 81.1 per cent to contend with the ovarian tumor at birth.

Nystroem from Engstroem's clinic in Helsingfors reports one hundred and eleven cases of ovarian tumors and pregnaocy without operation, in 25 per cent of which interruptions occurred. Of 37 cases operated on 13 per cent were followed by abortion

Sahnwald of the clinic in Breslau collected thirteen cases of ovariotomy during pregnancy with not one maternal death and only two abortions. (10 02 per cent)

Flatau gives statistics of two hundred and eighty-four cases of ovariotomy during pregnancy collected from the literature of 1802 to 2005. In forty cases or 77.2 per compregnancy was interrupted Two of these interruptions were criminal abortions performed after the operation. In two other cases the fault were macerated when delivered twenty-four hours after the operation. In one case the pregnant uterus was taken for a tumor and punctured. In two cases the abortion took place ten and twelve weeks expectively, after operation. These cases were left out and the statistics are then as follows:

Two hundred and seventy-seven ovarious with forty-two abortions or 1.1 per cent. The statistics further show that in many cases, not the ovariotomy, hut a more or less number of complications were the cause of interruption of the pregnancy. One case was complicated by "adenoma capillare" and adhesions Four cases of dermoids were found, two of them hilateral In two cases the tumors were ruptured during operation, most likely as a result of technical difficulties. Two cases were purulent and

one of them intraligamentous. Six cases had torsions and one case was complicated with pleuropneumonia. Thirty-nine cases of bilateral tumors were operated on and thirty-two came to term, two of the cases interrupted were bilateral dermoids, one complicated with hyperemesis and one had a second laparotomy for severe hamornhage.

Petri cites a case of Essen-Müller in which extignation of both ovaries with the corpus luteum was followed by normal delivery of a living child at term, two hundred sixty days after operation. Petri thinks that implantation of the ovum and continuation of the pregoancy do not depend upon the corpus luteum, and that normal ovariao tissue is necessary for implantation only, after which pregnancy may continue even though both ovaries be removed

Spencer reports forty-one cases, twelve of which were operated on during pregnancy and the remainder during the puerperium. Of the twelve cases operated on before delivery nine were operated during the first half of pregnancy and two of these aborted, both having double tumors removed, although enough ovarian tissue remained in one case, so that the patient had a succeeding pregnancy and went to term.

Spencer's forty-one cases had torsion fourteen times, this large percentage undoubtedly being due to so many of his cases having been dealt with during the puerperium. McKerron found torsion in 12.5 per cent

of one thousand, two hundred and ninety ovarian tumors at large, but found torsion in 30 4 per cent of cases during the puerperium. From these statistics we cannot fail to be impressed with the fact, that the usual hazards of ovarian tumors, namely: pressure, rupture, hæmorrhage, torsion, suppuration, etc., are greatly increased with the onset of pregnancy, some of them heing still more increased during labor, and are well-nigh appalling during the puerperium. To these hazards must be added the interferences to pregnancy and labor. They show such results with appropriate treatment, that abortion for simplification, or tapping for temporizing is unwarranted, or, to be liberal, rarely justifiable. They

show with convincing evidence, that coeliot-

omy with ovariotomy, even double, is followed by abortion only slightly in excess of the damage already done, pre-ents abortion from further damage, and brings the patient to labor at term, uncomplicated by presence of

They show that if the temporizing treatment is pursued many patients will abort, many will develop complications during pregnancy, and the remainder are brought to labor with the tumor present, making operative procedure common, and should defiver he accomplished, the patient but enters the most hazardous period, the puerperum. Spincer and others recommend that collotoms be performed immediately after defivers on account of the extreme danger of the puer-

persum

Time will not permit a discussion of the differential diagnosis, but a few points may be mentioned. Literature abounds with instances in which the sound has been used to differentiate between pregnancy and tumor or other conditions, but this shows a disregard for the child which belongs to another age Usually a careful in estigation will determine the presence of pregnancy and a complicating condition. In the absence of urgent symptoms careful observation is to be recommend of With urgent symptoms pregnancy and a surgical condition is suspected which will lead to exploration.

During pregnancy an ovarian tumor may be so high as to be misinterpreted for hydro-nephrosis, or tumor of the kidney spheen pancreas or liver. Sometimes in doubtful cases the X-ray may help to determine the presence of pregnancy and a shadow-producing material on the surface may show the factus not occupying the whole tumor.

In conclusion I would say

1. That pregnancy frequently takes place in the presence of ovarian tumors, even

though both ovaries be in olved

2 That with the onset of pregnancy we have two patients with one pathological condition, rather than one patient with two pathological conditions, each with claums upon their constitutional rights to "life, bherty, and the pursuit of happiness."

3. That the growth of the ovum produces

such changes in position and structure of ovarian tumors as to make it a menace to the child and mother during pregnancy, that extra hazards occur during labor and are at their height for the mother during the puer-

perium

4 'That induced abortion with its one hundred per eent of child mortality is unjustifiable, in that it offers no corresponding improvement in the condition of the mother.

5 The early removal of the tumor as soon as possible after its discovery, gives a high percentage of good results in both mother and child and removes the hazard during labor and the puerperium

6 'That abortion following ovariotomy any time during pregnancy is in proportion

to the damage already done.

7 That tapping or puncture of the tumor shows too large a mortality to make them justifiable procedures, except as preliminary expedients in rare cases.

8 'That the danger of abortion after double ovariotomies is not sufficiently great as to call for other treatment than that accord-

ed the single tumor.

9 The results during the latter half of pregnancy are such as to warrant removal of the tuntor rather than to let the patient con tinue to term, the increased percentage of abortion being due largely to increased damage previous to or during operation

10. A patient in labor with a complicating tumor should be placed in the most favorable surroundings possible, and labor allowed to terminate if unobstructed This should be faabtated by the use of forcep, if labor is all difficult and the tumor located well above the pelvis; position and manual efforts may change a pelvic obstructing tumor into an

abdominal non-obstructing one.

It Tumors interfering with labor pains,
or located so as to obstruct the outlet or piesenting torsion, hemorrhage, or suppuration,
thus offering immediate abdominal complications, may be operated upon with Cesarean
section accompanying, or, if the outlet is adequate, as shown by previous easy labors, or
by hiberal measurements, and the soft parts

by hieral measurements, and the soft parts well dilated, labor may be allowed to continue, after the removal of the tumor.

- 12. Vaginal Cæsarean section may be performed in some instances with inertia.
- Vaginal puncture of an obstructing tumor may rarely be permissible, but should be followed by vaginal or abdominal removal before or after labor, as puncture with nonremoval shows high mortality.
- In all operative procedures during pregnancy great care should be taken in manipulations of the uterus.
- The uterus shows such toleration, however, that necessary handling, even to stitching, need not be feared.
- 16. On account of the great risk of torsion and degenerations during the puerperium, an ovarian tumor should be removed as soon after labor as the patient's condition and surroundings will warrant If delay is necessary, the tumor should be closely observed

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UNILATERAL KIDNEY HÆMORRHAGE WITH REFERENCE TO SO-CALLED ESSENTIAL HÆMATURIA

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In a previous communication on the subject of so called essential hæmaturia, I called attention to the fact that the class of cases to which the term "essential hæmaturia" can now be applied are seen very rarely if at all (41)

The writings on this subject have been numerous and voluminous since the appearance of the above-mentioned publication, and in an overwhelmingly large number the various authors' views coincide with the views as expressed in the above-mentioned paper.

This rapid disappearance from our renal nomenclature of the phrase "essential hema-

turia" is due to the following factors

The universal employment of the cystoscope and ureteral catheter, by means of which one can more correctly diagnose the origin of the hamaturia, a procedure much

origin of the hamaturia, a procedure much neglected in former case reports 2 The more routine removal of pieces of

the kidney at time of operation for histologic

3. Pyclotomy in cases of suspected lesions

of the pelvis or calyces

4 Bacteriologic examination of the urine
obtained from each kidney separately by
means of the ureteral catheter

5 Careful and complete physical examinations

6 Routine employment of the X-ray Before taking up these factors in detail and discussing the recent literature on this subject. I wish to report the following case:

A C, aged 45 man, marned Previous History About five years ago the patient had his first attack of hematurn, whe settended over a period of about men monits. There was blood in the unne with each miclustion, but me requency of unnation. Associated with the harmatura were cramp like pains in the right upper quidrant of the addomen. In the beginning these quidrant of the addomen in the beginning these to call a physician during the might. The first attack of pain quickly subadied and he was free

from pain for three months, although the harmaturns continued during this time. At the end of the three months he was again seared with camp-like pain in the right upper quadrant of the abdomen bix months later he had a third attack of right side pain. He then entered the arrive of Dr. Bevan at the Preshyteran Hospital seeking relief from the mine of ten months, and now continued for about mine or ten months.

Examination: At this time I cystoscoped him with the following result. Bladder capacity ra ounces. The bladder mucosa was pale but otherwise normal. From the right uncertal orifice bloody urine was being emitted in spurts. From the left ureter clear urine was emitted. A diagnosis of right-sided humaturius was made.

hermaturis was made.

Operation The patient was operated on by Dr.

Bevan, who did a decapsulation operation The
patient maile an unce entitly recovery. There was

immediate relief from any further attacks of pain,
but the hermaturis remained uninfluenced by the
decapsulation, as the bloody urine continued for ten

months after the operation.

He then remained free from symptoms for about three and a half years, when the hematura returned. This attack of hematuras was also continuous, the urane being bloody all of the time, the painest, bowelete, was more free from prin, there being only mild attacks in his left said. He reacted the hospital and I again cystoscoped him for Dr. Beran. The bladder was normal. The urceral ordices and the internal arcthral omices emitted. The principle fit the hospital and was not entitled. The principle fit the hospital and was not entitled. The principle fit the hospital and was not entitled. The principle fit the hospital and was not entitled. The principle fit the hospital and was not have the principle fit of the hospital and was not have the principle fit of the hospital and was not have the principle fit of the hospital and was not have the principle fit of the hospital and was not have the principle fit of the hospital and was not have the principle fit of the hospital and was not have the principle fit of the hospital and was not have hospital and was not have the hospital and was not have the hospital and was not have the hospital and was not have have hospital and was not have hospital and w

Dr. F A Rettig Physical examination, Head and neck eyes react to light and accommodation; tongue is coated, posterior cervical glands enlarged. Thoray heart and lungs negative Abdomen; on deep palpation a sensitive spot was found one half inch to the right of the umbilicus,-there were sensitive areas along the right costal arch and above the pubes, genitalia, negative, nervous system negative Rectal examination prostate small. otherwise negative, right seminal vesicle sensitive left seminal vesicle negative Cystoscopy Mild decree of generalized trabeculzation, internal urethral orifice negative, left ureteral orifice con-gested and gaping, emitted bloody urine; right ureteral onfice occalive

Double ureteral catheterization. The catheters pass up into the pelves of both kidneys without any obstruction

Right

Bloody Acid Albumin Many te

Many red blood-cells
No pus-cells
No casts found
— A .98

— A 1 07
Urea 1 per cent
Phenoisulphonephthalein test appeared in 4½
minutes, exercted 28 09
per cent in one hour

— a .98
Urea o 7 per cent
Phenolsulphonephthalein test appeared in
four minutes, excreted
37 5 per cent in one hour

Left

Cryoscopy of blood, = - 56 Blood cultures were sterile Urine cultures were sterile Blood count. Red cells, 3,360,000 White cells,

Blood count. Ked cells, 3,300,000 Whate cells, 11,500 Hermoglobin, 65 per cent Sputum examination. No tubercle bacilit found, unnary examination for tubercle bacilit was negative. Blood-pressure Right arm, 122 mm, left arm, 118 mm X-ray examination was negative

Because of the long duration of the bleeding, of failure to check the hæmorrhage by medical treatment, and, in view of the negative physical findings, it was decided to operate on the left kidney, as it was conclusively proven to be the source of the hæma-

turin

Clear

Acid

Albumin trace

No pus cells

No casts found

Few red blood-cells

Operation, December 13, 1911 (Dr. L. E. Schmidt). The kindey as exposed through the usual object lumbar incision. The surface of the kindey was irregular, thousing many scars and retractions of a moderate degree. In spots, here and there, the capsule had the appearance of thekening. There was no marked change in the color of the kindey Decapualtion, with excision of a peece of kindey tissue for microscopic examination, was done. The wound was closed in layers and a cigarette drain inserted which was removed at the end of twenty-four hours.

Postoperative course. Immediately after the operation all blood disappeared from the unne, so that the urine was clear. No red blood cells were found in the centrifugalized specimens examined at regular intervals during the patient's stay in the hospital, "nor were any casts found." Convalescence was unventrial except for a slight catgut infector.

HISTOLOGIC EXAMINATION

The glomeruli presented various changes In some there was an increase in the nuclei which stained rather deeply Some of the glomeruli showed vacuolization of the cells covering the Malpighian tufts The most characteristic change in the glomeruli was the connective tissue change. This was variously increased; in some of the glomeruli there was

only a slight connective tissue thickening of Bowman's capsule; other sections showed this change more advanced, so that the entire glomerulus had undergone complete fibrosis A few of these glomeruli were surrounded by areas of round-cell infiltration.

The tubules showed various changes of degeneration, in some instances having gone on to complete necrosis. The lumen of the tubules contained a coagulated material. In others the lumen was completely filled with necrotic entitlelial cells.

The blood-vessels showed in many sections quite a marked thickening and in one area a well-developed encroachment of the thickened walls onto the lumen.

There was no increase in the interstitial connective tissue. The previously described areas of round-cell infiltration were limited to a few glomeruli.

The interesting features of this case are:

1. The long-continued duration of each

attack of hæmaturia.

2. The relatively long time between the

two attacks
3. The prompt cessation of the bleeding

following the decapsulation.

4. The very evident gross and microscopic

changes in the kidney.
5. Absence of albumin and casts in the

5. Absence of albumin and casts in the urine in the presence of marked nephritic changes in the kidney. (Postoperative examination).

It is unnecessary to go into the details of cystoscopy and ureteral catheterization at this time. It is quite apparent that this is the most accurate method at our command which furnishes definite data regarding the origin of the blood No one nowadays would diagnose a painless hæmaturia as a case of "essential hæmaturia," unless a cystoscopic examination has first been made. Still, one finds in the literature, case reports of "essential hæmaturia," in which no cystoscopic examination has been made This group of cases is further narrowed down by the employment of more recent additions to our diagnostic armamentarium, namely, the X-ray, the shadographcatheter, and pyelography.

The more routine removal of pieces of kidney tissue for diagnosis has done more Schenck (60) says that "until some competent observer reports a case in which there is no doubt but that the harmorrhage was from the kidney and that the kidney was normal in every part, as demonstrated by serial sections, we are justified in believing that idiopathic or essential harmaturia does not exist."

To this I would add the exclusion by cultural methods of infection by B. coli communis

and possibly other micro-organisms.

Katzenberg (39) is of the opinion that the cases of profuse kidney hæmorrhages, described as essential kidney hæmorrhage, are caused by beginning nephntic processes that are especially marked in the cortex and capilaries that cannot be demonstrated macroscopically, that can only be demonstrated microscopically by a most careful examination of pieces excised from various parts of the kidney

Even though the patient had been cystoseoped and the origin of the blood had been determined by the ureteral catheter, and if such a patient is operated on, several facts

should be borne in mind.

That often to gross inspection a kidney
may appear normal and on histologic study it
may show marked inflammatory or degenerative changes.

 That if the kidney appears normal and the microscopic sections do not show pathologic changes, perhaps we have overlooked a

lesion in the renal pelvis

Hence it might be advisable at times to perform a pyelotomy. The existence of lesions of the renal pelvis, in as much as they are usually devoid of subjective symptoms, may escape detection and be recorded as cases of essential hematuria. Lesions of the renal pelvis associated with hematuria have been well described by Guibe (29), Karafio-Korbutt (36), McGowan (48), Peterkin (54), Pilcher (55), Zimmer (72), and Von Frisch (23).

Zimmer speaks very strongly for vessel changes in the pyramids in those cases in which the parenchyma of the kidney is normal, and he also calls attention to a publication of Guthries on this subject as far back as 1902.

In his two reported cases he is inclined to look upon them as cases of essential hæmaturia, although he could not fulfil the dictum that before diagnosing essential hematuria the entire kidney must have been examined after serial sections had been made. He is inclined to believe, however, that in those cases in which the excised piece of kidney tissue does not show any nephritic changes, anomalies of the blood-vessels of the pyramids may be the cause of the bleeding. These vessel changes may be arteriosclerotic in nature, dilatation of the small vessels or angiomas of the publike.

Von Frisch (22) found a pyelitis granulosa in one of his hæmaturia cases.

In some of the cases, lesions both of the pelvis and the kidney were found—Keefe (37), Haynes (32), Karaffo-Korbutt (36).

Fullerton (23) found macroscopic changes in the form of adhesions, although he believes his case to have been one of hæmorrhagic nephritis.

From the literature at my command I have collected reports of eighty-two further cases not included in my previous report (41), variously described in the literature. Of this number histologie reports were found of twenty-seven In five of the twenty-seven cases there were no histologic changes. In three of these five cases - Graff (28), Warren (68), Zimmer (72) - an excised piece of Lidney was examined and found normal. This does not prove them to have been cases of essential hamaturia as by excision the pathologic process may have been missed as well as having overlooked lesions of the pelvis In the other two cases - Steinthal (65) and Reifferscheid (58) - nephrectomy was performed in each case and the entire kidney was subjected to a histologic examination without finding any pathologic changes "In the remaining twenty-two cases, changes of a nephratic nature were found "

Ballochy (3) case is interesting because of an occurrence of painless hematuria with several pregnancies. Nephrectomy: microscopic examination showed changes of a granular kidney. The patient subsequently became pregnant again. This pregnancy was accompanied by hematuria which disappeared after the child was horn.

Fowler's (20) second case is interesting

because of the multiplicity of the histologic changes found on microscopic examination.

CONCLUSIONS

- 1. Unilateral renal hæmaturia does not always mean unilateral disease, as one may be dealing with a bilateral lesion although only one side may be bleeding at the time of examination.
- 2. Absence of albumin and casts in the urine does not exclude the presence of nephritic changes in the kidney.

3. Cystoscopy and ureteral catheterization must be employed in each case to determine definitely the renal origin of the blood.

 Histologic examination of several pieces of excised tissue or preferably of the entire kidney must be made in every case before a diagnosis of essential hamaturia can be

5. Cultures of catheterized specimens of urine from each kidney, to determine a possible bacterial cause for the hamorrhage, must be made in all obscure cases.

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perhaps than any one factor in disproving the theory of "essential hematuria." This should include, of course, those cases in which a nephrectomy has been carried out and histologic examinations of the kidney have been made. A report of the histologic findings settles the diagnosh in the largest number of cases. But in cases in which the histologic report of an excised piece is negative, we must reckon with the possibility of a localized process or processes in the kidney which were not included in the excised piece of tissue, or of a lesion in the renal pelox

In my previous paper, I dealt with the reports of 130 cases, sixty two of which had had a microscopic report, lifty three cases showed various nephritic changes (4t)

The more carefully these cases are studied, the fewer are the cases which in the future will be called 'essential ha maturia

Recently a batterial phase has been added to the question. It has been suggested at amoust times whether or not so called esential hematuria might not be the result of infection by the colon bacillas. Billings (5) reports two interesting cases bearing on this subject.

"Make 1 Norman aged 24 had had internet tend hormstern for we care or more." A modern tend hormstern for we care or more in the negation of the modern and the second of the negadation per uniteral statistic contained pass and B code communis. Operation Nephresions. Bemuosed of the pelity was congested and links for A small section of adminy removed for histologic of the hymorrhapse after intercents of codes a variety.

GASE 2 A physician aged 5% was will ring from a right sided his maturit. A spectman of utility was obtained from the right killed per uniterial catheter. This contained a pure culture of B cols community. Disapparance of the hamaturity after the third injection of colon vaccine. No more bleehing.

A Elliott (18) also considers the possibility of *B. coli communis* inducing painless hæmaturia in his report of a case of toxic hæmaturia.

"The type of toxemus observed during the hematura was distinctly gastro-distential. It became apparent on investigation of this point that it was possible to induce hematura by directing the patient to cat freely of all red meats at the same time neglecting the bowels, which were somewhit torpid. Under these conditions heridache backache, and fever would anonear and the time neglectible the order of the properties of the p

concentrated and found to contain blood, albumin. and casts. A mercurial laxative coupled with a nonproteid diet never failed to control the symptoms. and so long as meats were avoided or consumed in strictly moderate amounts, there was no recurrence of the toxemia and the hamaturia. In this case there is established a direct connection lietween the harmatura and a toxemia induced by the ingestion of meats, in all likelihood a bacillus coli communis activity. It may even be possible that the kidneys during these periods of severe hamaturia were the seat of an acute hacterial layasion. Such an event may be more common than we at present realize We may, perhaps, be justified in assuming the ability of an acute bacterial infection of the kelness to cause by matures "

In his article on hematuria, William Hale White (6g) also mentions a lacterial factor in the production of harmaturia. "It is, perhaps, conceivable that the trouble is due to he passage of bretria from the blood through the kidney into the urine. This must be settled by fature investigation, but it must be remembered that in two of Katzenberg's cases the urine was examined hacteriologically without huding any milero organism."

The latternal factors in the production of harmstura will naturally lead us to ask whether on not many of the presently reported cases of essential hamatura in which no cause could be found for the bleeding were not due to infections by the colon bacillus or perhaps other metro-organisms.

Assle from the bacterial origin of printess læmaturia, the largest number of cases are due to inflammatory or degenerative changes in the kidney. This for the reason already stated earlier in this paper.

In a contribution to the etiology of unlateral nephritis, Gaudiani (23) comes to the following conclusions. "I rom our present knowledge we must assume that the so-called hamorrhagie nephralgias' are always called forth by some severe lesion of the kidney. With the exception of cases of tuberculosis, stone, tumor, torsion of the pedicle, or Bright's disease, all cases described as hemorrhagic nephralgia are due to circumscribed inflammatory processes and are cases of so-called unilateral nephritis. Pathologic experiments and clinical observations permit the conclusions that many of these lesions are the result of hacterial invasion of the kidney."

Golling (26) also favors an inflammatory origin of the bleeding "Renal hæmaturia not produced by the usual causes, stone, tumor, tuberculosis, is seen in hæmophilia, strains, traumatism, pregnancy and movable kidney. Usually the hæmaturias are produced by nephritic changes, not presenting uniform anatomic pictures, and hence cannot be more accurately defined The absence of albumin and casts does not exclude nephritis"

DeVaux (16) states that most authorities to-day are of the opinion that a so-called es sential hematuria does not exist. With few exceptions the kidneys extirpated for severe hemorrhages show changes histologically. It is true that in some of the cases the changes were so slight that some authors, notably Caspar, do not look upon any causal connection between the bleeding and the histologic changes. DeVaux further states "If the urine from the non bleeding kidney is normal it does not prove that this kidney is intact, because nephritis does not have to produce albumin and casts."

The statements of Golling DeVaux, and others, that nephritis does not have to produce albumin and casts, are borne out in the above-reported case Since leaving the hospital, I have had occasion to examine the patient's urine There was no albumin, casts, or blood present, although from the above-mentioned histologic findings he has a badly

damaged kidney

The fact that only one side bleeds at the time of examinations of a repeated examinations does not exclude the existence of a lesion in the other kidney. By referring to the history it will be seen that his two attacks of hæmaturia were four years aport and that only one side was bleeding at the time of operation; the opposite kidney was secreting a urine devoid of any characteristic changes upon which a diagnosis of nephritis could have been made

That both kidneys may be involved to the same extent by the same pathologic process and still only one be the source of active bleeding has been reported by others—Lane (2)

In a case previously reported I had the opportunity of witnessing this phenomenon Briefly the case was as follows:

A S., aged 22, had had a painless hæmatura of five months' duration, during which time his urine was never free from blood. The only pain of which the patient complained was in the upper left quadrant of the abdomen, which had persisted for about three weeks

General examination Temperature 10., pulse too Marked pallor of the skin and mucous membranes. The heart distinct apical pulsation in the fifth interspace, high accentuation of the second pulmone, a mitral murmur and a slight murmur oartic insufficiency. Abdomen heer palpable of the control of the finger- and too-nails of the finger- and too-nails.

Cystoscopically, bloody urine was being emitted from the left ureteral orifice and clear urine from the right. The first urnary report showed blood and albumin, no casts. The second urinary examina-

tion showed a few granular casts

At this time, a tentative diagnosis of tumor of the left kindney with bleeding was made. It was then decided to inflate the colon. Colonic distention showed the tumor mass to be anterior to the colon, thereby demonstrating that the tumor was not of renal origin, but was splent. The harmaturia persisted up to the time of the patient's death.

Post-mortem examination. Chronic endocarditis of the mitral valve, enormously hypertrophied heart, cyanotic induration of the liver, chronic splenic tumor with infarcts and a bilateral homorrhagic

nephritis

This case demonstrates that although both kidneys may be equally diseased by the same pathologic process, only one may be actively bleeding during the period of observation

Karaffo-Korbutt (36) believes that hæmorrhages from healthy kidneys without a pathologic basis appear to be very improbable. His case showed, besides nephritic changes,

lesions of the renal pelvis

Maiocchi (47) comes to the following conclusions: "A study of essential hematuria, in the sense of bleeding from a normal kidney, is not substantiated either by clinical or by pathologic observations. In practically all cases of so-called 'essential hematuria' inflammatory or degenerative changes are found."

Motz (49) also believes in an inflammatory origin of the bleeding: "Frequently the harmaturia is produced by lithiasis, tuberculosis, or tumor. In the larger majority of cases, however, the bleeding arises as a result of an interstitial and a glomerulo-nephritis"

Schenck (60) says that "until some competent observer reports a case in which there is no doubt but that the hemorrhage was from the kidney and that the kidney was normal in every part, as demonstrated by serial sections, we are justified in believing that idiopathic or essential hamaturia does not exist."

To this I would add the exclusion by cultural methods of infection by B. col: communis

and possibly other micro-organisms Katzenberg (30) is of the opinion that the cases of profuse kidney hæmorrhages, described as essential kidney harmorrhage, are caused by beginning nephritic processes that are especially marked in the cortex and capillaries, that cannot be demonstrated macroscopically, that can only be demonstrated microscopically by a most careful examination of pieces excised from various parts of the

kidney Even though the patient had been cystoscoped and the origin of the blood had been determined by the ureteral catheter, and if such a patient is operated on, several facts should be borne in mind

That often to gross inspection a kidney may appear normal and on histologic study it may show marked inflammatory or degenerative changes

2. That if the kidney appears normal and the microscopic sections do not show pathologic changes, perhaps we have overlooked a lesion in the renal pelvis

Hence it might be advisable at times to perform a pyelotomy The existence of lesions of the renal pelvis, in as much as they are usually devoid of subjective symptoms, may escape detection and be recorded as cases of essential hæmaturna Lesions of the renal pelvis associated with hæmaturia have been well described by Guibe (29), Karaffo-Korbutt (36), McGowan (48), Peterkin (54), Pilcher (55), Zimmer (72), and Von Frisch (22)

Zimmer speaks very strongly for vessel changes in the pyramids in those cases in which the parenchyma of the Lidney is normal, and he also calls attention to a publication of Guthries on this subject as far back as 1902.

In his two reported cases he is inclined to look upon them as cases of essential hæmaturia, although he could not fulfill the dictum that before diagnosing essential harmaturia the entire kidney must have been examined after serial sections had been made. He is inclined to believe, however, that in those cases in which the excised piece of kidney tissue does not show any nephritic changes, anomalies of the blood-vessels of the pyramids may be the cause of the bleeding. These vessel changes may be arteriosclerotic in nature, dilatation of the small vessels or angiomas of the papillæ

Von Frisch (22) found a pyelitis granulosa

in one of his harmaturia cases.

In some of the cases, lesions both of the pelvis and the kidney were found-Keefe (37), Haynes (32), Karaffo-Korbutt (36), Fullerton (23) found macroscopic changes

in the form of adhesions, although he believes his case to have been one of hemorrhapic

nephritis.

From the literature at my command I have collected reports of eighty-two further cases not included in my previous report (41), variously described in the literature Of this number histologic reports were found of twenty seven In five of the twenty-seven cases there were no histologic changes. In three of these five cases -- Graff (28), Warren (68). Zimmer (72) - an excised piece of Lidney was examined and found normal This does not prove them to have been cases of essential hæmaturia as by excision the pathologic process may have been missed as well as having overlooked lesions of the pelvis In the other two cases - Steinthal (65) and Reifferscheid (58) - nephrectomy was performed in each case and the entire kidney was subjected to a histologic examination without finding any pathologic changes "In the remaining twenty-two cases, changes of a nephritic nature were found."

Ballochs' (3) case is interesting because of an occurrence of painless hæmaturia with several pregnancies Nephrectomy: microscopic examination showed changes of a granular kidney The patient subsequently became pregnant again. This pregnancy was accompanied by hæmaturia which disappeared after the child was born.

Fowler's (20) second case is interesting

because of the multiplicity of the histologic changes found on microscopic examination.

CONCLUSIONS

- Unilateral renal hæmaturia does not always mean unilateral disease, as one may be dealing with a bilateral lesion although only one side may be bleeding at the time of examination.
- 2. Absence of albumin and casts in the urine does not exclude the presence of nephritic changes in the kidney.
- 3. Cystoscopy and ureteral catheterization must be employed in each case to determine
- definitely the renal origin of the blood. Histologic examination of several pieces of excised tissue or preferably of the entire kidney must be made in every case before a diagnosis of essential hæmaturia can be

made.

Cultures of catheterized specimens of urine from each kidney, to determine a possible bacterial cause for the hæmorrhage, must be made in all obscure cases

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SUCCESSFUL REMOVAL OF OVER ELEVEN FEET OF SMALL INTESTINE

By J DGAR R McGUIRE, M D. Berrelo Adjust Frol Surgery, University of Bufalo

THE removal of over two hundred centimeters of small intestine has always
aroused a peculiar interest judged
by the frequent reports of successful
cases. Leaving aside the pride of reporting
such cases, there is a certain scientific value
to carefully prepared reports of this kind,
because it is of great interest to know how
much intestine can be removed with safety
Purthermore it is of value to study carefully
the cause of death in those cases dying of
manition, whether directly following operation or in a year or two from that date. In
this connection, the following case report may
prove of interest.

20 years, referred by Dr. Harris of Iona-New York Approximately three weeks previous to operation nationt was taken ill with an inferted throat. He was continued to bed for several days and during this time suffered some pain in the abilomen, associated with vomiting. For a few days he improved, and intended resuming his work but on April's, 1912 he was taken with erimps in the abdomen which he ascribed to upostinution In the meantime his throat had practically recovered On the 6th and 7th he had more pain, cramp like in character but still not sufficient to confine him to the bed. On the 8th he began somiting which continued until the time of operation, namely, the 10th of April On the 0th there was considerable odor to the somitus and on the 10th it was distinctly facal. On this date he called De Harris, who sent him to the Buffalo General Hos-He had not had a howel movement since pital

April 7th When I saw the patient at the hospital it was apparent at a plance that he was an extremely suck man, with an expression not unlike the hoppoceatic facies - He had just vomited a considerable quantity of dark fæcal material, thus making a tentative diagnosis of intestinal obstruction comparatively The abilomin was distended tympanitic rertain and tender. No mass was palpable, rectal examinanon was negative, his temperature was on, pulse 110, leukorytes 15,000 The exact diagnosis was not quite clear, but several facts stood out prom-There was no herma present, no mass palpable, and no previous operative history-all, in a patient of 20 years, were pertinent factors in eliminating many of the rauses of intestinal obstruction. Further, his obstruction was not particularly rapid, he having been sick almost three

weeks Again one was almost forced to ronsider his present condition in some way dependent upon

his original infected throat At the time of the operation, the connection between the abdominal rondition and that of his throat was not ronsulered, but in view of the later developments of the rase, it now seems reasonable to suppose his mesenteric thrombosis was due to an intected theombus originating from his throat, Under other anasthesia operation was immediately performed I tound extensive gangrine of the ileum, extending within a few inches of the excum unward toe a considerable distance. At the carcal end the black color of the bowel faded into a purple, showing that the circulation of the lower end was only partially occluded. The mesenteric vessels were thromboard to such an extent that even the veins were full of clots | l.xcision was made at the base of the mesentery, well beyond the involved area Both ends were closed, and a lateral anastamosu was made, with suture, between tleum or fejunum and excum

At the time of operation I had no idea of the extent of the removal, only when measured did I appreciate it. The meentery was divided close to the bowel and the intestine then placed in a straight line on the floor without tension. It measured slightly over cleans feet, to be exact usit, cm.

The patient left the table in good condution and enjoyed an unusually quiet convalencence, with the exception of a hamorrhage which occurred, per rectum, on the jord hay lond for the fourth day he had seen stools without eathering, and varying he was placed on a dest rich in starches and sugars, with busmuth and even opium to control duarrhers, with busmuth and even opium to control duarrhers, which was placed on a dest rich in starches and sugars, with unsmuth and even opium to control duarrhers, which was made to be a support of the present turns he is graining in weight, having grired there pounds in the last weight and the product of the product of the product of the product of the support of the day.

There are several points of interest in three extensive resections, and it is quite important to report them in detail, not alone to determine how much intestine may safely be removed, but also to discover, if possible, the cause of these metabolic disturbances and to explain some of the tilscrepancies in the published results. Upon careful examination of literature, one is immediately impressed with the fact that many cases of resection of under 300 cm. life of inantion, and

others above that figure, even as extensive as 524 cm., have scarcely any disturbance. It would seem that the higher in the intestinal canal the resection is made, the less likely we are to encounter this trouble. It is more than possible, and I believe highly probable, but this explains certain discrepancies between different reports. In my case, the anastumosis was made at the excal valve and might explain the diarrhea when more extensive resection higher up would have none.

Furthermore, I am convinced that a great discrepancy exists in the method of measure-Every one bas seen an appendix contract following its removal, so one can well imagine the contraction in intestine following its removal might amount to several inches. So those cases where the bowel was measured previous to its removal would naturally be more extensive than those measured some time after removal. Further, a bowel distended with fæcal material will measure more from distention than one which is collapsed Again, if the mesentery be divided close to the intestinal tube, the measurement will be less than if measured around the outside of the bowel with the mesentery attached

My own particular case was measured in the worst possible way to make it appear a record case. It was measured outside of the body, without distention after the mesentery was removed, being placed without traction in a straight line on the floor. Had I realized at the time its extent, I should have measured it in each way to show the difference between methods of measurement.

In this connection, I measured the intestunal canal a few hours after death for a distance of eleven feet. After removal it measured ten feet and nine inches When measured with the measnety severed close to the gut and placed in a straight line on the floor, it was only ten feet and six inches. According to the accuracy with which the mesentery was removed the length varied all the way from ten feet, to ten feet nine inches.

In any event there must be some definite reason why metabolic disturbances follow the removal of 300 cm. in one case, and no

disturbance results in another instance of greater extent. I presume the total variance in length of intestine in different individuals may account for certain discrepancies, but it could scarcely account for the great difference which exists in the published results.

Physiologically fluids are absorbed from the large intestine, and so diarrhora follows the operation of removal of the large gut. It is fair to presume, where the resection has been made lower down, that the probabilities of diarrhora are greater. For instance, in my case the anastomosis was made at the caecum, removing the lowest portion of the lleum, and this might account for diarrhora, where even a greater amount removed higher in the intestinal canal would produce little or no disturbance. This fact doubtless explains certain discrepancies in the reports, but either errors or different methods of measurements explain the majority of them

The reason these cases suffer from metabolic disturbances is fairly clear Where the greater portion of the absorbing surface has been removed, the intestinal contents would remain in a fluid state, accounting for the diarrhoea. In considering measures for its relief when it is present, there are two ways of overcoming the difficulty. Either by placing the patient on a diet easily absorbed, or by giving a diet which would leave a large residue, making the stools more formed. There has been a good deal of work done along this line, both in dogs and in human beings, although comparatively few of the record human cases have been thoroughly studied from the chemical standpoint. It has been found in both buman and animal cases that carbohydrates are much better tolerated than the fats

My own particular case seemed to gain much better under the regular hospital diet for well patients than upon any special diet. For the first few weeks he was on a diet composed largely of starches and sugars, with a minimum of fats. While this was going on he was having from seven to ten stools a day, in spite of the fact that he was given bismuth and even opium. Under increased diet, however, he gained in weight and improved in every way physically, the stools being

	The state of the s		V		
No	Operator	Amount Reserved Cto	Result	Metabohe Disturbances	Hemarke
t	Ghedina	324	Recovery		Stratgulated berois
•	Nigrusols	140	Recovery	Moderate	Obstruction from adhesions
	Storp	310	Recovery	Moderate	Sarcoma of mesentery, recurrence, death
-	Stela	475	Recovery	Slight	Faligue alter exertion
5	Atheusen	473	Recovery	Modrate	Soleulus death 6 monthe later tuberculosis
_	Erledrich	400	Recovery		Functional short-circuit
7	Pauchel	400	Recovery	Violent	Gengrene hernia
	Machell	150	Recovery		
•	Herehus	165	Recovery	Stight	Abortoe repture of stream
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21	Gobell	100	Recovery	51451	Mesenteric Errors and refreshe

reduced to three or four a day 1 have urged him to return to the hospital for accurate observation in order to compare the intake with the output both from the point of view of carbohydrates and nitrogen, but he is doing so well at home that he refuses to again enter the hospital, and it is almost impossible to study these cases accurately in any other

way
While I was engaged in searching the literature for cases of extensive resection, I was fortunate in reading a similar article. I by Dr. I'lint, Professor of Surgery at Yale University The list appended is taken directly from his table in the May number (1912) of the Johns Hopkins Bulletin There are two changes which I have made. Case 45, reported 335 cm., should read 310, and, again, the number of cases of 200 cm is

now becoming so great that I have only included those successful cases of 300 cm and above

In analysing the following cases. I find my own case the most extensive resection on record due to mesenteric thrombosis. It is the second largest resection for any cause in American literature, and is the tenth largest in the entire literature | Furthermore, when one considers the differences in the metabolic disturbances, and the probable difference in measurement. I feel quite certain this care should really be higher in the list. Mesenteric thrombosis is a most serious condition, and without resection offers absolutely no chance of recovery One is, therefore, justified in attempting removal at all hazards, since anything short of complete extirpation means certain death.

SOME OBSERVATIONS ON THE PROTEIN METABOLISM OF NORMAL PREGNANCY AND THE NORMAL PUERPERIUM

BY JOHN R. MURLIN, Ph. D., NEW YORK CITY From the Physiological Laboratory of Cornell University Medical College

N February, 1911, the writer, with Mr Thorne M. Carpenter, reported observations made at the Nutrition Laboratory in Boston on the energy metabolism of three normally pregnant women and on both mother and child after parturition Since it was necessary to control the diet of the mother for the purpose of securing a uni form effect of the food on the energy metabolism, it seemed a good opportunity to collect a series of urines from normal subjects in the pregnant condition. No analyses as complete as those here reported have yet been made on such urines. Those of Edgar 3 and those of Ewing and Wolf' come nearest but they covered only the nitrogen fractions; only two or three urines as a rule were collected from each case, and there was no attempt to maintain a constant diet or to estimate the amount of nitrogen in the food.

Throughout the time of these observations, except for two or three days immediately following parturition, the patients were kept on diets 4 which were fairly uniform as regards the nitrogen content (see tables beyond) and the energy value, but which, yound) and the energy value, but which, and the energy value, but which, ally such as to constitute a rather restricted diet, but was sufficient except in Case 3 to maintain the body weight. This woman lost five pounds the five weeks she was confined to the hospital previous to parturition She was the only patient who complained of the diet, either because of the quantity or

quality of food allowed. However, as the records show that on most of the days she ate approximately the amount calculated for her, the diet could not have been distasteful. The chief objection was due to the absence of meat, a condition which was necessary in order to render the duet creatin-free (For further details regarding weight and general condition of the patients, see the charts in the lormer paner.)

Every day upon which urine was collected, the exact amount of food eaten was recorded by the nurse in charge. The amounts prescribed were weighed on the plate by means of a torsion balance sensitive to half a gram, the amounts uncaten being weighed back and deducted *

The urines were preserved with thymol in chloroform, to cc of a to per cent solution being placed in each bottle at the laboratory before the bottle was sent to the hospital When the urines arrived at the Nutrition Laboratory, they were measured, made up to uniform volume, and rebottled. Albumin was recorded only once (Case 2), and then was not abundant.

METHODS OF ANALYSIS

Ammonia was determined by the Folin method in the great majority of the urines within a day or two of their collection, and wherever signs of decomposition appeared, the results have been discarded The determinations of creatinin (Folin), creatin (Benedict and Meyer's conversion by autoclave) and of total nitrogen (Kjeldahl), in the order named, were made as rapidly as was physically possible. The urines were then stored in a large refrigerator for three months before the urea and sulphur analyses were completed. In one series (Case 3) the "formol-titrating" fraction was determined by the method of Henriques and

Curpote and Maila. Ashive Internal Med. not war pool as the "District pattern was engleved by Dr. John T. Wallmann Blooms Del. Son. "The pattern was engleved by Dr. John T. Wallmann Blooms Land Data. The Bougast threath the contrave of the Challes M. Garta March Carel for a confessions and through postpromass by Dr. John Carel F. John C. Land Data. The Challes M. Garta Sangara, and Charles and Carel Sangara, and Carel Sangara,

^{*} Edgar, N Y. M. J 1906, kxxxiu, p 897 * Ewing and Wolf Am J Obet , N Y, 1907 by p 289

Samples of these daily diets were given in the former paper

^{*}Both the regular on of dicts and for the most part, the collection of unues were faithfully carried out for the success of these observations in this particular the writer is indebted to Miss Zilla MacLauchlin the head unues of the hospital

Sorensen, 1 now known as their "old method," That is, the ammonia nitrogen was subtracted from the total fraction titrating with formalin. In urines which do not contain an excess of ammonia this method is almost as accurate as their "new method," in which the ammonia is removed before the titration with formalin.

For the total sulphur 2 the sodium-peroxide method of Osborne, following the procedure of Folin, was used; and for the inorganicsulphate and ethereal-sulphate fractions, the methods of Folin

DIFFICULTY OF PRESERVING POSTPARTUM URINES

One result of these observations should be mentioned at this point, namely, nearly all the urines in the puerperium of two out of the three cases showed a large amount of ammonia Since there was no sign of an acidosis of any kind, the excess of ammonia was evidently due to decomposition. But since these particular urines were collected and preserved with even more care than those of the antepartum period, the decomposition was for a time very puzzling This paper has, in fact, been delayed until the matter could be cleared up. In another paper pub lished recently by Dr H C Bailey and the writer the view has been advanced that ammoniacal decomposition may take place in the bladder after the use of the catheter, even though the usual aseptic precautions be observed The pertinent point in this connection is that the two patients (both primiparæ) whose urines showed decomposition were unable to void the urine spontaneously, and the catheter was used for several days following delivery, but the one whose urine

showed no decomposition (multipara), soided the urine spontaneously after careful cleansing of the parts and light packing of the vagina to prevent admixture of blood.

COMPARISON OF AVERAGE COMPOSITION OF THE URINE OF LATE PREGNANCY WITH THAT OF THE URINE OF THE PURPPERIUM

In Table I are summarized the average compositions of the urines from all three cases before delivery and after. For reasons which will be apparent later, the antepartum period in Cases 2 and 3 has been divided into two subperiods of ten days each. With Case 1. the antepartum period of observation was only five days, and one of the urines was not properly preserved, thus leaving only four days. With Case 1, every drop of urine was collected on the day of parturition and following, but the fifth day postpartum showed the first high ammonia. From this time on, the ammonia and the urea figures are excluded: but the combined urea-plus-ammonia figures are given, in the belief, confirmed by recent determination of total nitrogens, that no ammonia had escaped from the bottle the postpartum period of Case 3, the urine was not saved until the fifth day, and the ammonia and urea figures are for this day only, because the decomposition appeared on the sixth day Only one urine, the first after delivery, with Case 2 was lost entire, but on several other days a small quantity was voided with the faces and could not be separated. The amount lost was too small to affect the nercentage results

TOTAL NITROGEN

With the exception of Case 3, the total amount of nitrogen in the urine was almost exactly the same in the antepartum and postpartum periods Case 1 was probably not retaining nitrogen in the few days that preceded delivery. This is not unusual. A minus nitrogen balance at this time has been observed by Zacharjewsky, Slemons, Hahl, Bar and Daunay, and Hoffstrom ? The

Henriques and Sorensen Ztschr f physiolog Chena 2000 lx Idem toto law p 120

cAll of the sulphue analyses were done under the direction of the writer by Mr. Ernest A. Congdon a very careful analyst

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The writer when expeculty to except the Visilians under whom direction the excepts of a red in the state who was a finished as complete as possible. A possible out in the pages with the Balley the techniques of the pages with the pages of the page Murbn and Bailey J Am M Ase 1913 br. p egan

^{*}Zachsejewsky Zischt 1 Biol. 1904, 141 p 363 Slemons Johns Hopkins Hosp Rep 1905, gu, p tar

[&]quot;Hald Arthur I Graik toos lery, p at Bar and Daunay Archey de Physiol et de Path rénérair 1005

^{*} Hoffstrom Skand Archay f Physiol, 1910 xx11 p 326

reason is probably to be found in the failing appetite, especially in primipara; and possibly in catabolic changes which result in the onset of labor. Cases 2 and 3 were undoubtedly retaining nitrogen in both periods previous to delivery, more in the earlier period with Case 2 and more in the later period with Case 3. The significance of these differences for the percentage distribution of the nitrogen will be seen presently.

Since the amount of food taken by these patients just after delivery was very small (see the paper by Carpenter and Murlin, loc. cit.), there is no doubt that very much more of the nitrogen appearing in the urine at this time had its source in the body itself. All modern authorities agree that involution of the uterus is accomplished by a process of autolysis, and that a considerable portion of the products escape by way of the kidney. some probably being used in the formation of milk and a trace possibly making exit by way of the intestine. Authorities differ, however, as to the time when the autolytic products make their appearance in the urine Slemons (loc. cit) states that the nitrogen curve tends to reach a maximum on the third day postpartum, while the tables given by Zacharjewsky and Hahl show that the maximum comes somewhat later in their cases, and that the augmented excretion of nitrogen continues to the end of the second week. It is necessary, in order to determine accurately the appearance and disappearance of uterine products, to have the patient throughout on a constant diet Longridge 1 who seems to have taken more pains to fulfill this condi tion than other observers, noted superimposed on the gradual rise, which one would naturally expect following parturition, a secondary rise of about three grams nitrogen occurring quite suddenly at about the fifth day postpartum. Longridge accounts for this secondary rise by supposing that the circulation is not fully re-established following the rigid contraction of the uterus at the end of labor, and owing to kinking of the vessels, until about this time, consequently that autolytic products formed previously cannot be carried away as rapidly as they are produced.

1 J. Obst & Gynec . 1908 . xui, p 450

Longridge quotes Dakin's "Manual of Midwifery" to the effect that, on the evidence of frozen sections, the uterus does not diminish much in actual mass the first few days.

In Case 1, the nitrogen in the urine showed a sudden increase from 0 18 gms. to 12.03 gms. on the seventh day postpartum, and Case 3 a similar increase from 7.63 gms. on the fifth day to 9 54 gms. on the sixth day (See Tables II and IV) Since there was no corresponding increase in the food in either case at this time, it is probable that the rise corresponds to the one Longridge describes The writer has been unable to find any statement in the literature to support Longridge's view as to the return of the circulation, but in lieu of this explanation it is quite conceivable that the autolysis gains headway during the first few days and reaches a stage where diffusible products are set free in large quantity only at the end of the first week. The amount of nitrogen in the urine alone continued as high or higher than the nitrogen in the food in both these cases throughout the puerperium. In Case 2 it was lower at times, even when no urine was lost, before the end of these observations

AMMONIA NITROGEN

It is well known that the amount of ammonia in the urine depends on two factors: the nature of the ash furnished by the food and the amount of acid formed by the body. Sherman and Gettler's have shown recently that a change from potatoes to rice in the dict may be responsible for a noticeable increase in the ammonia excreted by the kidney, because rice furnishes more acid than potatoes. And Janney's has been able to drive ammonia out of the urine almost completely by administration of sodium carbonate with the food.

The table shows a considerably smaller amount of ammonia nitrogen in the post-partum urines than in those of the antepartum period. No doubt this is partly explained by the greater proportion of milk in the diet for the first few days of the puerperium, since

² Sherman and Gettler Am J Bol Chem, 1912, 21, p 323 2 Janney Zeschr f, physiol Chem, 1912, [xxvii, p 90

^{*}This is shown also by the tables of Van Hoogenbuyze and ten Doeschate (loc cit)

milk furnishes an ash that contains more bases than do most of the other foods given (see table compiled by Sherman and Gettler). However, all the patients returned to the same det which was given before confinement not later than the fifth day and yet the urines of Cose 2 (the only ones not decomposed after this time) continued to show low ammonias even when the total nitrogen was at the highest. The cythanation must be sought in the nature of the ask set free by the process of authors is come in the uterus.

URLA NITROGEN

This fraction is obtained by the I ohn meth od by subtracting the ammonta nitrogen from the "total amid" nitrogen which all such methods give, consequently it could only be determined in urines which had not changed after having passed the kidnes Cases 1 and 3 the number of such urines was too small to make the average composition in the postpartum period worth much for comparison with the antepartum period Hence we shall call attention to the comparison for the urea nitrogen only in Case 2 Here it is seen that the absolute amount of urea in the two periods is very nearly the same, 4.68 gms (mean of the two subperiods) before delivery and 5.77 gm- after amounts also bear very nearly the same relation to the total nitrogen in the two periods, 74 7 per cent before delivery and 75 2 per cent

URF 1-PLUS-AMMONIA FRACTION

Adding together the urea and ammonia nitrogens in the antepartum and postpartum periods of Case 2 we get 6 12 grams in the former and 6 10 grams in the latter, or 80.3 per cent of the total nitrogen on the one hand and 79 5 per cent on the other. For Cases rand 3 the absolute amounts are not so nearly alike in the two periods, but in relation to the total nitrogen they agree as closely as for Case 2; thus, Case 1, antepartum 86.4 per cent, postpartum 86 7 per cent; Case 3, antepartum 80.7 per cent, postpartum 87 per cent. This fraction represents in the protein

metabolism all the nitrogen which has been split off from the amino acids delivered to the circulation either from the intestine or

from the tissues; hence, if there should be any interference with the processes by which amino nitrogen is split off and converted into ammonia or to urea, we should expect to find this fraction low in proportion to the total nitrogen I wing and Wolf (loc. cit.). recognizing this possibility, argued that low urca plus ammonia nitrogen, which they found even in normal titrenancy, indicates an impairment of the metabolic functions of the fixer Van Hoogenhuyze and ten Doeschate in summarizing results on four normal cases, state that in three of the four they find "about the normal" figures (for non-pregnant persons) One of the three, however, was only in the fourth month, and may therefore be excluded from this comparison; while of the others, one (XIV) shows a combined percentage for both urea and ammonia nitrocen which as certainly somewhat below the standard from l'olin's work accepted by them What this standard is depends, as Polin has abandantly proved, on the total amount of nitrogen in the urine, and this in turn depends, among other things, upon the amount being retained for growth or replenishment. It is imposible to set an absolute standard for all persons and to say that anything below this percentage represents a departure from normal, without knowing all the conditions For this reason it cannot be said of the percentages reported above for the three cases in the present series that thry would not have been just as low under the same dietary regulations if the subjects had not been pregnant. Comparison with Folin's percentages for urine, which contained approximately the same quantity of total nitrogen is of little profit because of the very unusual dietary regulations which prevailed in his experiments

Nesettheless such a comparison shows that the figures given above in the antepartud division of Table I, like those of Ewing and Wolf, and all but one case of Van Hoogenhuyze and ten Doeschate, are slightly lower than average percentages selected for the same total nitrogen from 10nin's tables.

In a pregnant dog * it has been found that

s Ann de Cynéc, 2011 ed Sec. viu pp. 17 and 97 6 Maria - Am I of Physiol 1011, Exemp. 422 the combined urea plus-ammonia fraction becomes relatively lower as more and more nitrogen is retained for the growth of the developing fœtuses, a fact which affords an entirely different explanation of the altered partition from that given by Ewing and Wolf It means simply that nitrogen which is ordinarily excreted in the urine as urea or ammonia is the kind of nitrogen which is especially needed by the foctus for growth. The effect of withdrawing the bodies which furnish this nitrogen from the maternal circulation in large quantity would be to make the urea plus-ammonia fraction in the urine both relatively and absolutely less than in the non-pregnant condition. But if the quantity withdrawn is small in comparison with the total intake of nitrogen, the effect on the percentages might not be appreciable. In one of the cases reported by Van Hoogenhuvze and ten Doeschate, the total amount of nitrogen in the urine on most of the days was over twenty grams; hence the amount diverted for the fœtus each day scarcely made an appreciable change in the percentage composition of the urine. In the dog, the weight of the offspring at birth s larger in comparison with the weight of the mother than is the case with woman, consequently in the last weeks of pregnancy more nitrogen relatively is diverted, and the percentage of urca and ammonia nitrogen falls.

This fall, however, might not have been recognized in the dogs if the percentages had not been followed throughout the pregnancy, and it was seen that a relationship existed between them and the amount of nitrogen retained in the different weeks. It could scarcely be recognized at all in the pregnant woman unless (1) the food were constant or nearly so, and (2) the analyses were continued for a period of at least two weeks.

Both these conditions have been fulfilled in Cases 2 and 3 of this series The antepartum period is divided in the table into two subperiods of ten days each, and, as might be expected, the one in each case in which the greater retention of nitrogen probably 1 took

It is necessary to say "probably" because (r) the meroges in the food was not determined directly but was only estimated from Atwater and Bryant's average facures (Bulletin 28 Dept of Agriculture Publications), and (r) because the faces were not analyze 1. In the experiments

place is the one in which the percentage of urea-blus-ammonia is least.

"FORMOL-TITRATING" FRACTION

This was determined for only one case (Case 3) In absolute amount it is strikingly similar in each of the three periods two antepartum and one postpartum; but because the urea-plus ammonia fraction is relatively lower in the later antepartum period than in the earlier period, the percentage of the "formol-titrating" fraction is higher. This suggests the liehavior of an endogenous fraction which tends to remain constant in contrast with an exogenous fraction which varies with the amount of nitrogen in the food,2 etc If we may infer from this that the bodies (mostly mono-amino acids but possibly some polypeptids as well) which react with formalin have their origin in the body, it is a singular and important fact that they do not materially increase in amount during the involution period. The autolytic products, therefore, for the most part suffer conversion to urea before their excretion by the kidney

CREATININ

In both absolute and relative terms the creatinin is present in greater quantity before parturition than after in Cases 1 and 2. Case 3 does not show the difference, because the analyses for this substance were made on only two of the postpartum days. The higher absolute quantity in the antepartum urines is doubtless due in part to the ingestion of more creatinin in the food in this period. Patient 3, however, was on a creatin and creatinin-free diet throughout and ate slightly less protein (cf. nitrogen figures) in the later ten-day period than in the earlier. While the amount of creatinin for this patient on the fifth and sixth postpartum days was the same as in this later period, it was 80

of Hald and Hall-norm there is a noticeable increase to the amount of noticeae as the faces in the level days of pregnancy, the absorption probably being interfered with the state of the product of the difference observed however if applied to the present class we also only accounts the difference in retention to favor of the tarter period of the contract of the difference in the surface of the latter period of the contract of the surface of the surface of the latter period of Line 3 in would not offset the difference in Javor of the latter period of Line 3 in would not offset the difference in Javor of the latter period

aCf Felm Am. J of Physiol , 1905, 2111 p 66

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milk furnishes an ash that contains more bases than do most of the other foods given (see table compiled by Sherman and Gettler) However, all the patients returned to the same diet which was given before confinement not later than the fifth day and yet the urines of Cave 2 (the only ones not decomposed after this time) continued to show low ammonias even when the total nitrogen was at the highest. The explanation must be sought in the nature of the ash set free by the process of autolysis going on in the uterus

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In a pregnant dog 2 it has been found that

*Ann de Gyuéc 2012, 2d Ser , van pp. 17 2nd 03 *Mortin Am J of Physiol , 2011, 22viil p 411

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CASE 1 - (MRS A B) PRIMIPARA TABLE 11

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milligrams less (average) in the earlier tenday period, when more protein food was being taken This would seem to indicate that there is something characteristic about the appearance of more creatinin in late pregnancy. The same phenomenon was noted in two out of four pregnancies in the dog. Van Hoogenhuyze and ten Doeschate failed to observe it in their normal pregnancies, probably because in only one case out of seven in which this fraction was determined did they continue their observations later than one month previous to confinement As we shall see presently, they think they have found in the excretion of creatin during pregnancy evidence of a distinct hepatic inefficiency, but they do not appear to realize that their theory really demands a decrease in the amount of creatinin excreted, and this their tables do not clearly show

On no theory of hepatic inefficiency can an absolute increase in creatinin be explained Two other possibilities suggest themselves. that the creatinin excretion is roughly proportional to the mass of uterine muscle just as it is known to be for the mass of skeletal muscle,1 and that the increase in mass of the uterine wall in the last weeks of pregnancy is responsible, or, (2) that creatin is formed in the feetus late in pregnancy as it is in the infant,2 and is excreted through the maternal organs Rose 3 has analyzed the muscles of a new-born infant and found or per cent of If this substance is the mother substance of creatinin, it would seem that some creatinin should be produced before birth.

CREATIN

The behavior of this fraction before and after parturition is just the reverse of that of creatinin, namely, a greater quantity, in both absolute and relative terms, after parturition than before. The presence of creatin in large quantity in a postpartum urine was first reported for the woman by Shaffer (loc. cit) in October, 1908, and by the writer 4

*Mellanby, J of Physiol, 1008, 22271 p. 447. Gottlieb and Stangassinger, Zischr f physiol Chem. 1907, lit P 1, and 1008, lv. p Mutha Am J Physiol , 1908, xxia, Proceedings p xxxi

for the dog in December of the same year. Shaffer gave the correct interpretation of its presence as due to the involution of uterine muscle, and the writer noted that it reached its maximum for the dog on the fifth day post-More recently the writer has called attention to the fact that the creatin apparently is eliminated earlier than those autolytic products which (present in large quantity relatively in the dog) are excreted as constituents of the undetermined nitro-From Tables II and III it may be seen that the creatin excretion in these observations presents two maxima, one on the second or third day postpartum and the other on the eighth day The first may perhaps be due simply to a squeezing out of extractives while the uterus is rigidly contracted, and the second to the liberation of creatin by a true disintegration of the muscle tissue. Creatin is not to be regarded as a true product of autolysis, since it exists pre-

Why does creatin appear in the antepartum urines? Since the publication of Folin's work in 1905, it has been generally believed that creatin is not a normal constituent of adult urines unless creatin is being ingested in the food In other words, when present it is regarded as a sign of undernutrition or of actual disintegration of muscular tissue. Van Hoogenhuyze and ten Doeschate (loc. cit.) report its occurrence in a series of normally pregnant subjects on creatin-free food from the eighth to the tenth month, and accept its presence as a sure indication of hepatic inefficiency, basing their belief on the theory of Mellanby and of Gottlieb and Stangassinger * that creatinin is formed from creatin in the liver Confirmation of their observation is found in Case 3 of the present series, where only creatin-free food was given. Creatin was absent from the urine (Table IV) on only two days of the antepartum period. It is present also on every day of the antepartum period in Cases 1 and 2, when the food contained creatinin but probably no creatin (see note on page 47). • Muthn Am J Physiol, 1911, xxviii, p 422

formed in the muscle

¹ Cf Shaffer Am J of Physiol, 1908 xxiii p 1 ² Cf Amberg and Mornil, J Biol Chem 1907, in p 31x Sodprick J, Am M Am, 1919, by p 2178, Van Hoogenhuyse and ten Doestchate, loc ch.

Rose J Biol Chem . 1951 x.p 165

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Child form June 22, p m

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milligrams less (average) in the earlier tenday period, when more protein food was being taken. This would seem to indicate that there is something characteristic about the appearance of more creatinin in late pregnancy. The same phenomenon was noted in two out of four pregnancies in the dog. Van Hoogenhuyze and ten Doeschate failed to observe it in their normal pregnancies, probably because in only one case out of seven in which this fraction was determined did they continue their observations later than one month previous to confinement. As we shall see presently, they think they have found in the excretion of creatin during pregnancy evidence of a distinct hepatic inefficiency, but they do not appear to realize that their theory really demands a decrease in the amount of creatinin excreted, and this their tables do not clearly show.

On no theory of hepatic inefficiency can an absolute increase in creatinin be explained. Two other possibilities suggest themselves: (1) that the creatinin excretion is roughly proportional to the mass of uterine muscle just as it is known to he for the mass of skeletal muscle,1 and that the increase in mass of the uterine wall in the last weeks of pregnancy is responsible; or, (2) that creatin is formed in the fœtus late in pregnancy as it is in the infant,2 and is excreted through the maternal organs. Rose a has analyzed the muscles of a new-born infant and found or per cent of creatin If this substance is the mother substance of creatinin, it would seem that some creatinin should be produced before hirth

CREATIN

The behavior of this fraction before and after parturition is just the reverse of that of creatinin, namely, a greater quantity, in both absolute and relative terms, after parturition than before. The presence of creatin in large quantity in a postpartum urine was first reported for the woman by Shaffer (loc. cit.) in October, 1908, and by the writer *

for the dog in December of the same year. Shaffer gave the correct interrenation of inpresence as due to the invitation of main muscle, and the writer noted that it made its maximum for the dog on the interest More recently the same has called attention to the fact that the country parently is eliminated earlier the autolytic products which (proces E large quantity relatively in the dici are exceedas constituents of the underental single gen. From Tables II and III in mark be seen that the creatin except in the observations presents two marine, or go the second or third day postparter and the other on the eighth day. The free may jet haps he due simply to a squeezing out of extractives while the uterus is nicht and tracted, and the second to the Dentity of creatin by a true disintegration of the made tissue. Creatin is not to be remarded as a true product of autolysis, since it exicts peformed in the muscle.

Why does creatin appear in the antepertum urines? Since the publication of Fount's work in 1905, it has been generally believed that creatin is not a normal constituent of adult urines unless creatin is being ingested in the food. In other words, when present it is regarded as a sign of undernutrition or of actual disintegration of muscular tique Van Hoogenhuyze and ten Doeschate (ke. van Proogering ikke. ly pregnant subjects on creatin-free food from ly pregnant something the eighth to the tenth month, and accept its presence as a sure indication of hepatic in efficiency, hasing their belief on the theory of Mellanby and of Gottlieb and Stangard of Menancy and is formed from training ger * that creating is formed from training ger that Gonfirmation of their observation the liver.

is found in Case 3 of the present series where is found in Case 3 or the present sens, where only creatin-free food was given Citatin was absent from the urine (Table IV) on the two days of the antepartum period by two days of the alternation of t period in Cases 1 and 2, when the food on period in Cases but probably no delin (se

• Murha Am J Physiol 1911, ktvid, p 412 • Mellandy, J of Physiol 1904, ktvid, p 425 Stangassunger, Zischr I physiol Chen, 1997, lu p 1 42 Carb, pt 1997, lu p 1 12 Carb,

¹Cf Shaffer, Am J of Physiol., 2003 xxm p 1

²Cf Amberg and Mornil, J Biol Chem 2007, in p 351,
Soffenck, J. Am M Ass. 1950, W. p 1576, Van Hoogenhuyze and
ten Doeschate, loc cit

Rose. J Biol Chem . 1gar, x.p a65

Murks, Am J Physiol . 1908, xxvii, Proceedings, P xxxi

Mention has been made above of one serious objection to the explanation given by van Hoogenhuyze and ten Doeschate. namely, that an hepatic inefficiency would seem to demand a decrease in the excretion of creatinin corresponding to the increase of creatin A better explanation, it seems to the writer, is one similar to that given by Rose (loc cit) for the presence of creatin in the urine of growing children Mendel and Rose 1 have demonstrated the intimate relationship between the creatin metabolism and the supply of carbolis drates in the food lowing out this idea. Rose supposes that the carbolivdrate is used up so rapidly in the synthetic processes of growth that it does not avail to prevent the climination of creating Similarly, in pregnancy it may well be that an actual deficiency of carbohydrate in the maternal circulation exists because of the ready and rapid diffusion of dextrose through the placenta and its fixation in the foctal tissues

TOTAL PERCENTAGE ACCOUNTED FOR

Because the purin nitrogen was not determined in these urines, it seems better not to speak of the nitrogen remaining after subtraction of the several fractions as "undetermined" or "rest nitrogen," but simply to adulte percentages accounted for Naturally his total in the antepartum period of Case 3 is not comparable with the total in the other cases, and cannot be given at all for the post partum period of Case 3. The four fractions determined in Case 1 give the same total for the antepartum as for the postpartum period. The figures are slightly different for Case 2.

THE SULPHUR IN THE URINE (N S RATIO)

Since sulphur is a constituent of the great majority of food and tissue proteins, the output of this element may be used as an index of protein metabolism quite as well as that of the nitrogen. The ratio of the two elements one to another (N:S) in the urine is very constant under any given dietary condition. Benedict found the N:S ratio on the fifth, sixth, and seventh days of starvation to be 16 2:1,4 and Catheart's found it to be

1511 as the average for a fourteen-day fast, According to the figures given by Hamalainia and Helme, 'the ratio on a mived and adequate diet varied between 10 2 and 14,6, with an average of 12 2. It would appear from this that a well-nourished person would exercte through the kidney more sulphur in comparison to the nitrogen than a starying person.

So far as known to the writer, attention has never been directed to this ratio for the pregnant subject From Hoffstrom's tables (loc cit), however, it may be learned that the ratio for the entire period from the 17th to the 40th week of pregnancy is 11 g, and for the 10th and 40th weeks alone 124 and 12,2, respectively For the three cases here reported the average ratio for the entire antepartum period is as follows: Case 1 (4 days). 13 8, case 2 (20 days), 13.1; case 3 (20 days), 135 - somewhat higher, therefore, than Hoffstrom's figure for the entire period of his observations The difference may possibly be accounted for by the difference in potential energy of the food, his single patient receiving considerably more per unit of weight than either of the three of this series.

For the postpartum period the ratios in two of the cases are slightly higher than for the antepartum period, namely 147 and 134 as against 138 and 131. For the third case, where the average does not include the first fourdays of purperium, the days when the diet was very restricted, the ratio is slightly lower in the postpartum period, 13, 33, sagning 133,5.

It is worthy of note that the same days which mark the sudden increase in the output of urmary nutrogen (see p 45) witness also a corresponding increase in the output of the total sulphur (Tables II and IV)

PARTITION OF THE SULPHURS

In the pregnant dog it was observed that the inorganic sulphate sulphur, like the ureaplus-ammonia nitrogen, was low in percentage where the nitrogen retention was greatest and that the neutral sulphur behaved in a reciprocal sense I in these cases also it is evident that the lowest percentage of in-

^{*}See Link, Science of Nutrition, and ed. 1000 p. 67 et seq.

*Catheart Binchem Zischt, 2007, vi. p. 200

*Stand Archivi Physiol. 2007 kit. p. 132

organic-sulphate sulphur, like that of the urea-plus-ammonia nitrogen, coincides with the highest retention of nitrogen (Case 3, second antepartum period), and the highest percentage coincides with the lowest retention (Case 1). The reverse is true of the neutral sulphur only in Case 1. It probably would have been true of Case 3 but for the high percentage of ethereal-sulphate sulphur, due to indicanuia caused by the milk diet,

As emphasized in the paper on the pregnant dog, this higher percentage of neutral or unoxidized sulphur does not indicate a condition of suboxidation in normal pregnancy, as held by Zweifel' and others; for there is no increase in the absolute sense, and the total oxidation per unit of weight is just as great in the pregnant as in the non-pregnant woman. The distribution of the sulphurs indicates that the sulphur which is excreted as inorganic sulphate is the sulphur held back for growth of the product of conception (uterus, membranes, placenta, feetus)

The similarity between the antepartum and postpartum periods extends also to the percentage distribution of the different sulphur fractions. The case which shows the highest percentage of inorganic-sulphate sulphur and the lowest percentage or neutral sulphur in the antepartum period shows the same for the postpartum period Likewise the case which shows the lowest (average for entire period) percentage of inorganic-sulphate sulphur in the former exhibits the same in the latter.

Summarizing all these resemblances between the two periods, it is evident that the maternal organs of excretion have very much the same work to do, in the qualitative sense at least, immediately after the child is born as immediately before.

SUMMARY

- In three cases of normal pregnancy followed by normal puerperium, the distribution of the nitrogen and sulphur fractions of the urine was very nearly the same in the antepartum and postpartum periods.
- 2. The total nitrogen in the utine shows a "Zweld Archiv! Gynik 1902 km p r Cf L Zonis Archiv! Gynik 1916 zc p 452, and Carpenter and Matha total loc cit.

sudden increase, independently of the nitrogen in the food, at about the sixth or seventh day postpartum.

 The nitrogenous autolytic products from the uterus are for the most part converted to urea before excretion.

 The ammonia nitrogen is slightly higher in the antepartum period than in the postpartum period.

5. The urea-plus-ammonia nitrogen in the antepartum period is lowest in percentage of the total nitrogen, when the retention of nitrogen is prohably greatest. This confirms the idea, expressed elsewhere for the dog, that the nitrogen held back for growth of the product of conception is potentially urea or ammonia nitrogen.

The "formol-titrating" fraction is the same after delivery as before

7. The creatinin nitrogen is higher, both relatively and absolutely, before delivery than after, the creatin nitrogen higher in both senses after delivery than before. There is no indication in the urine of hepatic inefficiency in late pregnancy. Creatin in the urine before delivery may indicate a lack of carbohydrate in the food, after delivery it is always present during the involution period.

8 The N'S ratio in the urine of these patients was slightly higher than is usually found on an adequate diet Because less food was ingested immediately after delivery than before, the ratio was higher in the postpartum period.

9. The inorganic-sulphate sulphur was lowest in percentage of the total sulphur where the retention of nitrogen was (probably) greatest, and highest where the retention was least. The neutral sulphur was least in percentage where the retention was least, but, owing to indicanuria, was not greatest where the retention was greatest.

10. A high percentage of neutral or unoxidized sulphur does not indicate diminished oxidation in the pregnant subject.

II. The distribution of the sulphur fractions indicates that the sulphur which is excreted as inorganic sulphate is the sulphur held back for feetal development.

*This concidence has recently been reached also by Th Heynemann (Zischr i Geburtah u Gyndke, 1912, [xii p 110] whose paper was received after this one had gone to press

beginning proliferative osteo-arthritis can be detected. This is probably the result of irritation. (See Fig. 3.)

The irritation of a foreign body in a joint may lead to a proliferative process in hone. and is another example of irritative traumatic osteo-arthritis. Fig. 4 is the radiograph of an ankle-joint which contained a small, loose piece of bone, (b) indicates the loose piece of bone and (a) shows the proliferative osteo-arthritic change at the lower edge of the tibia.

It has been demonstrated, therefore, that trauma, in its various forms, can produce not only an arthritis but also a chronic prolifera-

tive osteo-arthritis. The chronic joint diseases known as Heberden's nodes, osteo-arthritis of the knees, malum coxæ senilis, and spondylitis deformans have all been grouped together by recent observers Thus, Goldthwait has designated this class of chronic joint diseases "hypertrophic arthritis," while Jones groups them all under the bead of "osteo arthritis." Jones summarizes the chief characteristics of "osteo-arthritis," as follows. "It is a disease rarely met with under forty years of age. The mode of onset is generally insidious. never really acute. It attacks both sexes equally Although it may be polyarticular, its specific tendency is to be monoarticular. or, more accurately speaking, oligoarticular, with no marked leaning toward symmetrical distribution It displays a marked predilection for attacking the large joints, such as the hip and shoulder Constitutional symptoms, such as emaciation, rapid pulse, pyrexia, pigmentation and trophic disturbances, are generally absent Muscular atrophy is slight, hardly ever pronounced, likewise muscular spasm and contracture. Local characters of the articular swelling, general swelling, if present, due to synovial effusion, not to periarticular thickening, hence no spindle-shaped Joint abrupt and nodular in appearance shape. Displacement of the bones, if present, lateral in direction The older and more inveterate the articular lesion, the greater the enlargement of the joint."

The above mentioned diseases have been grouped together by Jones, Goldthwait, and others, because their characteristic pathological lesion is a chronic proliferative change in the bone; in other words, a chronic proliferative osteo-arthritis. For the same reason, these diseases can be here classified under the head of traumatic osteo-arthritis, not because their etiology is known, but because the proliferative osteo-arthritis which characterizes them, in their early stage at least, is similar to that caused by known trauma.

There is nothing new in the suggestion that trauma is the cause of this class of disease Trauma has always been given a prominent place in the etiology of malum coxe senilis. Hoffa has called attention to the resemblance between the anatomical lesions of so-called osteo-arthritis and traumatic arthritis, and suggests that in many instances a long forgotten trauma may have supplied the initial impulse to the morbid process. Bowlby bas shown that intra-articular hæmorrhages can initiate osteo-arthritic changes in the subjects of hæmophilia. Without speculating further as to the form of trauma which can cause this class of disease, the fact remains that the initial lesion, as shown by the X-ray, corresponds to that of a traumatic osteo-

arthritis. Fig. 5 is a radiograph which shows the earliest change which can be demonstrated by the X-ray in cases of proliferative osteoarthritis in the knees It will be noticed that there is a squaring of the patella as compared to a normal patella The small rice shaped body, posterior to the joint, is probably a sesamoid bone in the external head of the gastrocnemius muscle. Fig 6 shows the squaring of the patella somewhat more advanced, while Fig. 7 shows a slight spur formation at the lower and posterior surface of the patella. Compare the bony lesion here shown with the proliferative bony change in an ankle-joint irritated by a foreign body (Fig. 4), and in a knee-joint the subject of villous arthritis (Fig 3), and it will be seen that they are the same, or very similar. Fig 8 is the radiograph of a case in which the spur formation has become more marked, and, in the case shown in Fig. o, the spur formation has become very pronounced. Fig 10 shows the radiograph of a case of advanced pro-



Fig r Traumatic osteo-arthritis of a finger joint, due to the joint's having been injured by a baseball. Note the proliferative osteo-arthritis and suggestion of spur formation as indicated by the arrow

Fig 2 Traumatic oster-arthritis, metatarsophalangeal joint of the big toe in halfux valgus. The arrows indicate the spur like character of the proliferative oster-

liferative osteo-arthritis of the knee. There are spurs on the upper and lower edges of the patella and there are also spurs on the articular surfaces of the fernur and tibia. Fig. 11



Fig 4 Traumatic osteo-arthritis of the ankle joint due to a foreign body, (a) spur formation, (b) foreign body in ankle-joint

shows a still further advanced case of proliferative osteo-arthritis of the knee; the proliferative bone changes have become very marked and secondary degenerative and



Fig 3 Traumatic osteo-arthritis of the knee-joint due to villous arthritis. The arrow indicates a spur on the upper and posterior edge of the patella showing proliferative osteo-arthritis.



Tig 5 Traumatic osteo arthritis of the knee-joint, "Osteo-arthritis" (Jones) Early stage. Note squaring of the patella

THE CLASSIFICATION OF ARTHRITIS

By JOHN McWILLIAMS BERRY, M. D., AUSTAY, NEW YORK Orthopaths Surrous and Endographer to the Albary Housed

THE classifications of injuries and diseases of the joints have always been more or less confusing. This confusion has occurred mainly in the classification of the chronic diseases, and has been due to. a lack of knowledge of their citology, a misunderstanding of pathological findings, and the ambiguity which has arisen from individual observers describing the same disease under different names, or applying the same name to widely differing condi-

tions Within the last few years, however, this confusion has become less. The tendency at the present time is to divide chrome arthritis into two main classes, one class being characterized by hypertrophic and being characterized by hypertrophic and deformans, which in the past has often been used to designate a clinical entity or specific condition, is now usually employed in a general manner to include both hypertrophic and attrophic forms of chronic joint diseases, and there is an indication that eventually this term will be dropped.

Goldthwait classified the chronic diseases of the joints into infectious, atrophic and hypertrophic arthritis. Under the head of hypertrophic arthritis, he groups such diseases as Heberden's nodes, malum core senilis and

spond) litis deformans
Jones, in his recent book entitled "Arthritis
Deformans," makes only two classes rheumatoid arthritis (corresponding to Goldthwait's alrophic arthritis) and osteo arthritis
(corresponding to Goldthwait's hypertrophic
arthritis)

Nathan, in the Journal of the American Medical Association for June 17, 1911, divides the chronic joint diseases into inflammations or infections and degenerations, i.e., trophic diseases He subdavides these into arthritis or osteo-arthritis, depending upon whether the soft parts or the bony parts of a joint are affected thus:

- I Inflammations or infections.
 - a Infectious arthritis
 - b Inlectious osteo-arthritis.
- II Degenerations, i. e , trophic diseases.
 a. Trophic arthritis
- b Trophic osteo arthritis.
- The degenerative or trophic diseases he further subdivides as follows:
 - a Trophic arthritis
 - 1 Metabolic arthritis
 - b Trophic osteo-arthritis
 - Senile osteo arthritis
 Neurotic ustage arthritis
 - Neurotic e-teo-arthritis
 Metabolic e-teo-arthritis.

In this classification, senile osteo-arthritis corresponds to Goldthwait's hypertrophic arthritis and Jones' osteo arthritis, and metabolic osteo arthritis corresponds to Gold-

thwait's attophic arthritis and Jones' rheumatoid arthritis. It will be seen therefore, that even now

there is considerable ambiguity in the classitication of joint diseases

will be of interest

Nichols and Richardson, in the Journal of Medical Research for 1000, xxi, 140, reported an extensive study, with autopsy findings of sixty five cases of chronic joint disturbance of the hypertrophic and atrophic types They found that the cases fell into two categories proliferative and degenerative. The result of their work has been well summarized in an editorial in the Journal of the American Medical Association for December 4, 1009, and on account of its direct bearing on the classification of chronic joint disease the following quotation from the editorial

"It being a general law of pathology that the same agent may cause either proliferation or degeneration, in accordance with concentration, tissue nutrition, and other factors, it follows that these two pathological groups do not correspond to two different sets of etiological factors or to two different diseases, but merely represent tilderent effects from similar causes or similar effects from different causes; lerences, corresponding to the degenerative and proliferative types of joint changes, when either of these types occur in a sufficiently distinct way, but since the presence of proliferative changes in one part of a joint may cause degenerative changes in another part, or conversely, it is evident that both anatomic changes and clinical manifestations are often of mixed character. It is also evident that, once the injury in the joint has been started. a vicious circle is readily established, for a primary degenerative change may start up problerative processes in the neighborhood, and these, causing degeneration of opposed surfaces, the process becomes progressive, hence the had prognosis of arthritis deformans and the mixed anatomic picture which has caused so much confusion of classification and pathology. Once the joint injury has become well established, therefore, the pathologic changes may continue even when the original etiologic factor has disappeared, and when this factor is a chronic persisting one the course of the disease must necessarily be downward "

clinically, however, there are well marked dif-

The work of Nichols and Richardson is of great importance in explaining the pathology of that group of chronic joint disease commonly designated by the term arthritis deformans, but there are objections to their conclusion that the two types (degenerative and proliferative) making up the group are only different manifestations of the same discased condition. There is such a difference in the two types in their initial lesion as shown by the X-ray (to be demonstrated later) and their clinical manifestation is so distinct that they should be classified separately

As Nichols and Richardson have pointed out, the pathological changes characterizing the group are either proliferative or degenerative; moreover, one pathological change may lead to the other, and tice tersa would be well, therefore, in considering these two types to avoid a classification based on pathological changes; also in classifying to avoid a term like rheumatoid arthritis, which in itself means nothing; and there is no more reason in using the term osteo-arthritis to designate a specific class of joint disease than there would be to call a certain disease of the heart, heart disease, and give all other diseases of that organ individual names. A classification of joint diseases, based upon known etiological and anatomical factors, seems to offer the least opportunity for confusion.

The recognized factors which can cause arthritis are three in number, viz.: trauma, infection and trophic action. These etiological factors acting on the tissues of the ioint cause either an arthritis or an osteoarthritis, according to whether the soft parts of the joint alone, or the bony parts also, are affected.

A classification from an etiological and anatomical standpoint would, therefore, be as follows:

1. Traumatic.

a. Traumatic arthritis.

b. Traumatic osteo-arthritis

II. Infectious.

Infectious arthritis.

b. Infectious osteo-arthritis III Trophic

a. Trophic arthritis

Trophic osteo-arthritis

Traumatic arthritis may be caused by direct violence to a joint, by the use of a joint at a disadvantage, as in so-called static arthritis of the knces in certain cases of flat foot, and finally, from chronic irritation due to other causes such as loose bodies in the ioint anatomical abnormalities, etc. Possibly, also, circulating toxins cause a chronic irrita tion in joints, but, so far as the writer knows. there is no direct experimental proof of this.

Villous arthritis of the knees, as described by Goldthwait, may properly be classified as a traumatic arthritis; the cause seems to be either a static trauma or a chronic irritation.

A chronic traumatic osteo-arthritis, proliferative in character, can apparently be caused by simple trauma Fig 1 shows the radiograph of a finger-joint that was injured by a baseball several years before. There is present a general proliferative osteo arthritis of the ends of the bones and a suggestion of spur formation. Somewhat the same condition, but with more pronounced spur formation, can be found in certain cases of hallux valgus. The abnormal position of the big toe causes repeated trauma to the metatarsophalangeal joint, and a radiograph may show an osteo-arthritis with small bony spurs. (See Fig. 2.)

In certain cases of villous arthritis, a slight



Fig 6 Traumatic osteo-arthrib of the knee joint, osteo-arthritis" (Jones) Later stage than Fig 5 Squaring of the putella more marked

atrophic changes have taken place This bears out the findings of Nichols and Richardson that atrophic changes occurred secondarily in proliferative processes in the joint



Fig 7 Traumatic osteo-arthritis of the knee-jour "osteo-arthritis" (Jones) Later stage than Fig 6 arrow indicates a spur formation



Fig 8 Traumatic osteo-arthritis of the knee joint, "osteo arthritis" (Jones). Later stage than Fig 7 Spur formation more marked

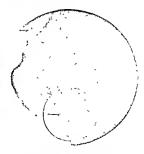
In like manner a series of radiographs of the disease known as "Heberden's nodes" will show the initial demonstrable X-ray lesion to be a proliferative osteo-arthritis, also that this proliferative osteo-arthritis increases in degree until in the later stages degenerative changes occur.

The X ray of a normal finger-joint (Fig. 12) shows the joint edges of the bone rounded in outline and the articular ends somewhat rarefied as compared to the shaft. The first demonstrable X-ray lesion of a proliferative osteo arthritis (Heberden's nodes) begins as a thickening and squaring of the bone at the articulation, but there is no increase of rarefaction (Fig 13) The squaring becomes more pronounced with a suggestion of spur formation (Fig 12) This is followed by actual spur formation (Fig. 15) which gradually becomes more marked and is associated with prohferative changes in the entire articular end of the bone (Fig 16) Fig 17 shows the spur formation and other proliferative changes still more marked this case degenerative and atrophic changes are taking place, as is shown by the rarefying

the bone In Fig 18 the proliferative and



Fig 9 Traumatic osteo-arthritis of the knee-joint, "osteo-arthritis" (Jones) Later stage than Fig 8 Spur formation pronounced



lig to Traumatic esteo arthritis of the knee joint "osteo-arthritis" (Jones) Later stage than Fig 9 The arrows indicate spurs on the femur and tibin

in Fig. 19 the atrophic changes can almost be said to predominate

Fig 20 shows the radiograph of a beginning case of malum cox senils. Note the proliferative osteo arthritis which shows itself as a hook-like spur on the edge of the acetab

Fig 2: shows a spur formation on the vertebra. The subsequent history of this case is not known, but it would seem that sooner or later it must have shown symptoms of spondylitis deformans

Fig 2' is an anterior posterior view of the neck of a patient who suffered from a letsided spasmodic torticollis associated with pain The radiograph shows a proliferative osteo-arthritis of the transverse processes on the left side of the cervical vertebyre

In a summary of the above it can be said that trauma is an important etological factor in arthritis and osteo-arthritis, that the characteristic lesion of a traumatic osteoarthritis is a proliferative osteo-arthritis, and that the characteristic lesion of the disease grouped together under the head of "hypertrophic arthritis," or "osteo arthritis," is a proliferative osteo arthritis, which in its early stage cannot be distinguished from the

proliferative osteo arthritis produced by

Infection as an etiological factor in causing joint disease is well understood and no discus-



Fig ir Traumatic proliferative osteo-arthritis of the knee joint, "osteo-arthritis" (Jones) Later stage than Fig 10 The arrow indicates an area of proliferative ostitis which is undergoing secondary degeneration

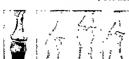


Fig 12 Fig 13

lug 12 Normal fincer joint

Lig 13 Traumatic enter-arthritis of fager joint (Helenten's node), early stage. Note slight thickening and sourcing of the hone at the arthribation.

170 to

Tie 15

Fig. r4 Traumatic coleo-arithms of finger joint (Heterilen's node), little stage than Lig. r3 Squaring more pronounced with a suggestion of spur formation

Lig 15 Traumatic esteo-arthritis of finger joint (Hel erden's node) later stage than Lig 14 Spur formation

Fig. 16 Traumatic osteo arthritis of finger foint (Helserden's node) later stage than Fig. 15. Spur for-

sion as to infectious arthritis or osteoarthritis caused by various known organisms is necessary. In the main it can be said that infectious arthritis is characterized by synovitis and suppuration and infectious osteoarthritis is characterized by degenerative changes in the bone

Trophic action is the third great causative



Frank Frank



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Ing a? Traumatic extremethritis of fineer joint (Illedenden's nobe), bitter stare than Fig. 16. Eput normation and other prediferative changes more marked. Degenerative and atteptic changes have also laken place, as a shown by the rarefying of the hone.

Fig. 18 Traumatic networathritis of finger joint

(Reberder's node), letter stage than I ig 17. Proliferative and atrophic changes have both increased. ITE so Traumatic osteo-arthritis of finger joint (Reberder's node), later stage than I ig 15. Atrophic (Reberder's node), later stage than I is 15. Atrophic

(Helerden's node), later stage than Fig 15 Atroph changes almost predominate.

factor in arthritis and osteo-arthritis and the evential characteristic of this type of disease is an atrophy or degeneration.

A well known example of a trophic osteoarthritis is found in Charcot's joint. Fig. 23 is the radiograph of a Charcot ankle-joint; it will be seen that degenerative and proliferative changes are both present but the pre-



Fig 20 Traumatic osteo-arthritis of the hip-joint (malum coxx senilis) The arrow indicates spur formation on the edge of the acetabulum



Fig 22. Traumatic osteo-arthritis of the cervical vertebra, "osteo-arthritis" (Jones) The arrow indicates the area of greatest proliferation



Fig 1. Fig 2

Fig 2. Traumatic osteo-arthritis of a finger joint, due

Fig 1. Traumatic osteo-arthritis of a finger joint, due to the joint's having been injured by a baseball. Note the proliferative osteo-arthritis and suggestion of spur for matten as indicated by the arrow.

mation as tedested by the arrow.

Fig 2 Traumatte osteo-arthritis, melatarsophalangeal joint of the big too in hallux salgus. The arrows indicate the spur-like character of the prohierative osteoarthritis.

liferative osteo-arthritis of the knee. There are spurs on the upper and lower edges of the patella and there are also spurs on the articular surfaces of the femur and tibis Fig. 11



Fig 4. Traumatic osteo-arthritis of the ankle-joint due to a foreign body, (a) spur formation, (b) foreign body in ankle joint

shows a still further advanced case of proliferative osteo-arthritis of the knee; the proliferative bone changes have become very marked and secondary degenerative and



Fig. 3. Traumatic osteo-arthritis of the knee-joint due to villous arthritis. The arrow indicates a spur on the upper and posterior edge of the patella showing proliferative osteo-arthritis



Fig 5 Transactic esten-arthritis of the knee-joint. "Osten-arthritis" (Jones). Early stage Note squaring of the patella



Fig. 5 Traumalic osteo arthrelis of the knee point, costeo arthress. (Jones) Later stage than Fig. 5 Squaring of the putella more marked

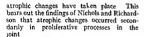




Fig 7 Traumatic osteo-arthritis of the knee-joint, "osteo-arthritis" (Jones) Later stage than Fig 6 The arrow indicates a spur formation:



Fig 8 Traumatic estee-arthritis of the knee-joint, "osteo arthritis" (Jones) Later stage than Fig 7 Spur formation more marked

In like manner a series of radiographs of the drease known as "Heberden's nodes" will show the initial demonstrable X ray lesion to be a proliferative osteo-arthritis, also that this proliferative osteo-arthritis increases in degree until in the later stages degenerative changes occur.

The X-ray of a normal finger-joint (Fig. 12) shows the joint edges of the bone rounded in outline and the articular ends somewhat rarefied as compared to the shaft. The first demonstrable X-ray lesion of a prohierative osteo-arthritis (Heberden's nodes) begins as a thickening and squaring of the bone at the articulation, but there is no increase of rarefaction (Fig. 13) The squaring becomes more pronounced with a suggestion of spur formation (Fig 14) This is followed by actual spur formation (Fig 15) which gradually becomes more marked and is associated with proliferative changes in the entire articular end of the bone (Fig. 16) Fig. 17 shows the spur formation and other proliferative changes still more marked this case degenerative and atrophic changes are taking place, as is shown by the rarefying of the bone In Fig. 18 the proliferative and atrophic changes have both increased, while



Fig. 9 Traumatic estee arthritis of the knee joint, "estee-arthritis" (Jones) Later stage than Fig. 8 Spur formation pronounced

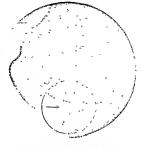


Fig to Traumatic osteo arthritis of the knee joint, "osteo-arthritis" (Jones) Later stage than Fig 9 The arrows indicate spurs on the femur and tibia

in Fig 19 the atrophic changes can almost be said to predominate

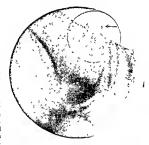
Fig 20 shows the radiograph of a beginning case of malum coxe senilis. Note the proliferative osteo arthritis which shows itself as a hook-like spur on the edge of the acetabulum

Fig 27 shows a spur formation on the vertebra The subsequent history of this case is not known, but it would seem that sooner or later it must have shown symptoms of soondviltis deformans

Fig 22 is an anterior posterior view of the neck of a patient who suffered from a left sided spasmodic torticollis associated with pain. The radiograph shows a prohierative osteo arthritis of the transverse processes on the left side of the cervical vertebrae.

In a summary of the above it can be said that trauma is an important etiological factor in arthritis and osteo-arthritis, that the characteristic lesion of a traumatic osteoarthritis is a poliferative osteo-arthritis; and that the characteristic lesion of the diseases grouped together under the head of "hypertrophic arthritis," or "osteo arthritis," is a problerative osteo-arthritis, which in its early stage cannot be distinguished from the proliferative osteo-arthritis produced by known trauma

Infection as an etiological factor in causing joint disease is well understood and no discus



Tig rr Traumatic proliferative osteo-arthritis of the knee joint, "osteo arthritis" (Jones) Later stage than Fig to The arrow indicates an area of proliferative ostitis which is undergoing secondary degeneration



Ing 12 Fig 13

lig 12 Normal finger joint
Fig 13 Traumatic estee-arthritis of finger joint

(Hebenien's node) early stage. Note slight thickening and squamp of the line at the articulation. Fig. 14. Traumitte osteo-arthritis of finger joint (Hebetien's node), hirr stage than lig. 13. Squamp

more pronounced with a suggestion of spur formation

ig 15 Traumatic extender that is of finger joint
(Hel erden's node), later stage than Fig 14 Spur formation

by 16 Traumatic ester-arthritis of finger joint (Heleriten's node) later stage than big as Spur for-

sion as to infectious arthritis or extenarthritis caused by various known organisms in necessary. In the main it can be said that infectious arthritis is characterized by spot-vitis and suppuration and infectious osteoarthritis is characterized by degenerative changes in the bone.

Trophic action is the third great causative



Fig 16





. Fig

mation more marked. Problerative changes in the entire articular end of the bone

Fig. 87. Traumatic osteo-arthritis of finger joint (Helerden's node), later stage than Fig. 16. Spur formation and other prohierative changes more marked. Degenerative and attorphy changes have also taken place.

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lie so Traumatic or teo arthritis of finger joint
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shanges almost predominate

factor in arthritis and osteo arthritis and the essential characteristic of this type of disease is an atrophy or degeneration

A well known example of a trophic osteoarthritis is found in Charcot's joint. Fig. 23 is the radiograph of a Charcot ankle-joint; it will be seen that degenerative and proliferative changes are both present but the pre-



Fig 20 Traumatic esteo-orthritis of the hip-joint (malum coxe semils) The arrow indicates spur formation on the edge of the acetabulum



Fig 22 Traumatic osteo-arthritis of the certical vertebra, "osteo-arthritis" (Jones) The arrow indicates the area of greatest prohibiration.



Fig 24 Fig 25 Fig 26 F
Fig 24 Trophic osteo-arthritis of a finger some (gout)

Note rarelying of bone and punched-out areas

Fig. 25. Trophic osteo arthritis ("rheumatoid arthritis") of a finger joint. Farly stage. The arrow indicates
the shadow of the swollen soft parts.

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Ing 26 Trophic osteo arthritis ("rheumatoid arthritis") of a finger joint I ater stage than I ig 25 The
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Fig 27 Trophic osteo-arthritis ("rheumatoid arthritia") of a finger joint. Later stage than Fig 26 Rare

dominating change is degenerative. A simpler form of trophic osteo-arthritis is found in gout. Fig 25 is the radiograph of a finger affected with gout, note the rarefying ostilis and the punched-out appearance of the bone at the articular ends. This is a markedly different bicture from that seen in cases of

Fig 27 Fig 28 Fig 29 Fig 30.

) laction increased and punched-out areas at the articular surface

Fig 28 Trophic osteo-arthritis ("rheumatoid arthritis") of a finger joint. Later stage than Fig 27. Articular end of bone has worm-eaten appearance.

Fig 29 Trophic osteo arthritis ("rheumatoid arthritis") of a finger joint Later stage than Fig 28 Practically a loss of the joint Fig 30 Trophic osteo arthritis ("rheumatoid arthritis")

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Fig 21 Traumatic osteo-arthritis of the spine (spondyluts deformans) The arrows indicate spur formations on the vertebre



Fig 23 Trophico-teo-arthritis of ankle-joint (Charcot's joint). Degenerative and proliferative changes are both present but degenerative changes predominate.



ing 31 Trophic esternathritis to et eurosenil arthra in) of a knee joint | Rarefying voides

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The gradual development of the atrophic changes in the above described disease can best be seen in a series of radiographs of the tinger. The eathest change in a joint affected by this atrophic form of disease is a swelling of the soft parts, causing them to throw a slight shadow (Fig. 25) At the same time or possibly a little later a rarefaction at the lateral surface of the articular ends of the bone can be made out (Fig. 26) Later the rarefaction increases and nunched out areas appear at the surface (Fig. 27) Later still, the rarefaction continues to increase and the articular end of the bone has a wormeaten appearance (Lig 28) This may lead to practically a loss of the joint (Fig. 20) It has already been shown how in the late stages of a proliferative osteo arthritis secondary atrophic changes may appear other hand, in the later stages of an atrophic arthritis secondary changes of a proliferative nature may occur I'ig 30 shows proliferative changes even to the formation of spurs occurring in the last stages of a tropluc osteoarthritis.

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I. Traumatic

- 1. Traumatic arthritis.
 - a Simple traumatic inflammation synovitis
 - Villous arthritis
 - 2. Traumatic osteo-arthritis

a Bony spurs

- b Proliferative osteo-arthritis in hallux valgus, in joints subject to irritation of foreign bodies, etc.
- Heberden's nodes
- d Proliferative osteo-arthritis of the knees
- e Malum coxæ senilis
- Spondylitis deformans

II. Infectious

- 1. Infectious arthritis caused by organ-
- 2. Infectious osteo-arthritis caused by organisms.

III Trophic

- 1. Trophic arthritis.
 - Metabolic arthritis (Nathan) Trophic osteo-arthritis.
 - - a Charcot joint
 - b. Gout
 - e Syringo-myelia
 - d. Rheumatoid arthritis (Iones). atrophic arthritis (Goldthwait), metabolic osteo arthritis(Nathan)

Forms of arthritis other than the above mentioned can be placed in the classification according to their etfology and the anatomical changes characterizing them

ETIOLOGY, PATHOLOGY AND TREATMENT OF OVARIAN CYSTS IN RELATION TO CHILD-BEARING, WITH SPECIAL REFER-ENCE TO HÆMORRHAGE INTO THE CYSTS

BY WALTER CLINTON JONES, A. M., M. D. CHICAGO Assistant Professor of Surgical Pathology Medical Department University of Illinois

HE following unusual case, which occurred in the experience of led to the preparation of this paper.

Patient, Mrs G, Kankakee Illinois

Family and personal histories, negative

Present illness On July 2d her family physician

Dr E C Hamilton, dehvered her of a child Preg nancy and delivery were apparently entirely normal Within twenty minutes after the end of the second stage, the abdomen had become greatly enlarged, so much so that the doctor thought he must have overlooked another baby in the uterus However, on internal examination he found the uterus empty (after the delivery of the placenta) and the enlarge ment was thus demonstrated to be outside the uterus There were no symptoms of hæmorrhage nor any other pathological signs, nothing but a pelvic and abdominal enlargement

The writer saw the patient for the first time, in consultation with Dr Hamilton, on July 8th, and diagnosed a collection of fluid, probably an ovarian cyst, but I was doubtful on account of the unusual history

The enlargement gradually increased and the patient was getting weaker so that it became evident to Dr. Hamilton that something must be done to save the patient's life I was called in again, just one month after the first visit tumor by this time had increased in size to nearly twice that of a normal pregnancy but with the prominence decidedly more marked on the left side The patient's general condition was fairly good The physical findings were very distinctly those of an ovarian cyst, but I still had some misgivings on account of the strange history However, the case evidently was surgical and so I did a laparotomy

A median incision led into a large cavity, from which was obtained more than six quarts of rather thick chocolate-colored fluid. It was evident at once that we were dealing with a cyst and that the fluid was largely hæmorrhagic in origin Adhesions to the surrounding structures were separated with much difficulty, the pedicle, which coincided with the pedicle of the left ovary, was ligated and the cyst was removed The tube on the same side was also ablated An inflamed portion of the omentum about as large as a hen's egg was removed, the uterus was suspended in anterior position, and the abdomen closed The patient withstood the opera tion well She was slow in reacting but ultimately made a complete recovery



Lig i Photograph of gross specimen, writers case P pedicle, O, adherent omentum. For further description, see text

PATHOLOGICAL ANATOMY

Gross (Lig 1) The cyst arose from and included the entire left overy. It extended unward and to the left so as to occurs this sule of the alsomen more than the right reaching well up under the costal arch. It was adherent very firmly to the abilominal wall the omentum and the blockler, also somewhat to the intestines. The shape was usoul and the tumor lay so that its long axis was parallel with the longitudinal axis of the body. The longer diameter, after preservation in Laberling solution, is about 22 cm and the shorter one about to em Disternied it holds about 514 litres of fluid and collapsed and crushed together it file a quart jar The cyst is multilocular, consisting of one very large and four small sacs. These latter range in diameter from one to four cm and are filled with clotted blood and fluid. They all he within the wall of the large cyst The wall of the latter varies in thickness from one mm to two em, while ad herent to its inner surface are many partially organized clots of blood

The uterus was markedly retroverted, the tubes were practically normal, and the appendix was normal. The abdominal wall was attenuited to

about one half its normal thickness.

Misroscopical 1 Cyst wall (Fig. 3) This consists of ordinary ovarian stroma composed of connective tissue with a considerable admissiance of incoluntary muscle cells. The long axes of the cells and fibres are for the most part, parallel with essurface of the cyst. There is considerable

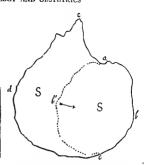


Fig. 2. Diagram of probable mechanism of the occurteme of hamorrhage in the writer's case. I or description, see test p. 69.

and round-celled infiltration is fairly

The most prominent pathological finding is hamorrhige, it is very abuniant and corresponds to the vanety which Daniel calls "hamorrhage infiltration". In places it appears in relatively well-defined spots, while in other areas it occurs as a rather even insiltration with blood-cells.

No traces of epithelial cells liming the interior of the cyst were found. There is no evidence of degeneration nor of any other regressive change.

2 Contents ol large cyst 1 luid, color, chocolar, checkeder, slight and of no particular character, epice, feet gravity, 1037 On standing, it separates into two layers of about cquil thickness, an upper, chocolate-colored, and a lower, graysh Albumen, very abundant Microcopoucill, large numbers of butments of the colored characteristic colored, that might be said to be almost semi-purulent

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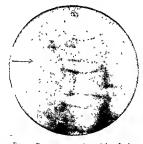


Fig 21 Traumatic osteo-arthritis of the spine (spondylitis detormans) The arrows indicate spur formations on the vertebrae



Fig. 23 Trophic osteo arthritis of ankle joint (Charcot's joint). Degenerative and proincrative changes are both present but degenerative changes predominate,



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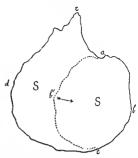


Fig 2 Diagram of probable mechanism of the occurrence of hamorrhage in the writer's case. For description, see text, p 69.

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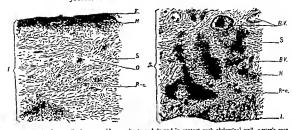


Fig. 3. Section from wall of cyst on side opposite to pedide and in contact with abdominal wall, writer's case, 1, area including external surface, 2, area including external surface, 5, internal surface, 5, ovarian stroma; 0, Globean R-c, round-relied indictation, 1ll, areas of harmorings; B. V. biodivessels. Note the tilinease of the wall of the larger vessels. X roo. (Size and outlines obtained by vision with both types simultaneously, one looking into the microscope and the other at the drawing sheet, thus projecting onto the paper the images in the microscope.)

I have been able to find in the literature only one case which resembles this one closely. It occurred in the practice of R. G. LeConte, and is described briefly as follows:

The patient was twenty-seven years of age Before her last pregnancy her pelvis and abdomen Dr. LeConte were normal, as far as known. saw her six weeks after a normal child had been delivered at a normal labor. "After dehvery it was noticed that the abdomen remained about as large as it had been previously." She was operated about six weeks after labor, and the cyst was found to contain nearly four gallons of "dark-brown fluid." Dr. Cattell, who made the pathological report, said it was a "multilocular cystoma of the ovary. The contents of the large cyst were of a clear grayish red color and weighed a little over thirty-two pounds avoirdupois. The smaller cysts were filled with colloid material. The size when extended with water after removal varied from eight and one-half to ten and one-half inches in the various diameters." LeConte seems to assume that the growth took place entirely during pregnancy and that there was no particularly sudden enlargement immediately after delivery.

The following cases are also somewhat similar to the writer's, especially in regard to the time of the discovery of the tumor (immediately after delivery) and as to the rapid enlargement of the growth during the early puerperium:

Marshall reports a case in which the patient stated "that after labor her abdomen remained larger than at full time pregnancy." No tumor had been noticed by her family doctor-

Hammond relates a case in a woman who had borne six children Subsequent to the birth of the fifth child, she noticed a swelling of the abdomen. During her sixth pregnancy, her abdomen was exceedingly large, but lahor was normal. After

this birth, her abdomen rapidly increased in size. Itall tells of a patient whom he saw for the first time four weeks after delivery. "She was greatly emaciated and had a large ovarian tumor in her abdomen." He operated her eleven days later and

found a "multilocular tumor of the ovary, probably malignant. . . The tumor was first discovered immediately after delivery and was not larger than an adult head." Patton reports a case where enlargement due to

an ovarian tumor during pregnancy did not disappear after labor. Two and a half weeks later torsion of the pedicle occurred and the cyst was removed surgically

H. R. Spencer, in a report on forty-one ovarian cysts on which he had operated, mentions the time ol discovery of the tumor in seven instances as immediately after labor. (No further details are given in regard to this point.)

In reviewing the literature dealing with ovarian cysts, one is greatly hampered by the incompleteness of many of the reports. In numerous instances the most important facts are entirely omitted. However, McKerron, Williams, Patton, Lea, Daniel and many others have written excellent articles from which we can collect a large fund of useful



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"This affection differs from the foregoing (osteo arthritis) in that it is most commonly met with in persons under forty years of age It attacks women much more frequently than men Its specific distribution is polyartic ular, with marked leaning toward symmetrical invasion of joints. It evinces a pronounced preference for the smaller joints, the hip and shoulder often remain immune Constitutional symptoms are much more conspicuous, pulse often quickened, temperature in more acute forms raised, extreme emaciation not uncommon Muscular spasm prominent, muscular atrophy intense and widespread with contractures Tropluc disturbances of varied nature and degree always present, such as pigmentation, vasomotor phenomena, and in advanced cases glossy din Local characters of articulty swelling, kin over joint waxy white or semi applying in tint. Outline of joint smooth, rounded and spindle in shape, with, as a rule, no irregular bony projections at the line of articulation. Deformities are due to muscular spars and are usually in the direction of luxation and hyperveten-ion but rarely if ever is there lateral dis-butement."

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The classification of arthritis based upon ctiological and anatomical changes, which I wish to present and in which I believe, as shown in this paper, all forms of arthritis and osteo-arthritis can be placed, is as follows:

I. Traumatic

- Traumatic arthritis.
 - a Simple traumatic inflammation, synovitis
 - b Villous arthritis
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 - Proliferative osteo-arthritis in hallux valgus, in joints subject to irritation of foreign bodies, etc
 - c. Heberden's nodes.
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 - e Malum coxæ senilis
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II. Infectious

- Infectious arthritis caused by organisms.
- Infectious osteo-arthritis caused by organisms.

III Trophic

- Trophic arthritis
- Metabolic arthritis (Nathan).
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 - a. Charcot joint b Gout
 - Gout
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Forms of arthritis other than the above mentioned can be placed in the classification according to their etiology and the anatomical changes characterizing them

ETIOLOGY, PATHOLOGY AND TREATMENT OF OVARIAN CYSTS IN RELATION TO CHILD-BEARING, WITH SPECIAL REFER-ENCE TO HÆMORRHAGE INTO THE CYSTS

By WALTER CLINTON JONES, A. M., M. D. CHICAGO
Assistant Professor of Surgical Pathology. Medical Department. University of Illinois

HE following unusual case, which occurred in the experience of the writer, led to the preparation of this paper

Patient, Mrs G, Kankakee, Illinois Family and personal histories, negative

Pretrai sthear. On Julyan the family physician, Dr E. C. Hamilton, delivered her of a child. Pregnancy and delivery were apparently entirely normal within twenty munters after the end of the second stage, the abdomen had become greatly enlarged, so much so that the doctor thought he must have overlooked another baby in the uterus. However, on internal cammation he lound the uterus empty chart the delivery of the placental and the enlargement of the commence of the contraction of the commence of the commen

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Total

information. The most valuable of these contributions is that of McKerron.

First, in regard to the frequency of ovarian tumors during pregnancy, the following statistics from McKerron are instructive:

Flasschlen s times in 17.812 premancies Loblein a times in 1,300 pregnancies Tarnier 1 time un 1,738 pregnancies

1 time 10 2,600 pregnancies Average The frequency of cystic as compared with solid tumors of the ovary has been investigated by Kelly, Olshausen, McKerron, and others Averaging the figures of these three men, we find that cysts constitute from eighty five to ninety per cent of all neoplasms of the ovary. Hence one must remember

when dealing with statistics which include all

tumors of the ovary that nearly nine tenths

8 times in 20,870 pregnancies

of them are cysts As to the likelihood of encountering difficulties with ovarian tumors in relation to child-bearing, Williams says that serious trouble of one kind or another occurs in at least one fourth of those present during labor and the puerperium; while Lea holds that fifty per cent of those occurring during the

puerperium cause grave symptoms About twenty-five per cent of all ovarian tumors occurring during pregnancy lie in the pelvis and are seldom discovered till after the onset of labor. The other seventy five per cent are abdominal in location

CLASSIFICATION OF VARIOUS KINDS OF

HÆMORRHAGE INTO OVARIAN CYSTS

A. According to sequence of time and cause
I Primary "Harmorthagic infiltration simultapeous with development of cyst" (Daniel) II. Secondary An accident or complication, twisted

pedicle, chief cause

B. According to torsion of pedicle and relation to childbeamng

Torsion of pedicle (always secondary)
 No torsion of pedicle (primary or secondary)
 Independent of pregnancy

a In connection with pregnancy

a. Before delivery b During delivery

e During puerperium C. According to location of hamorrhage-I In cyst wall.

II. Intracystic. III. In pedicle.

IV. In persioneal cavity
V. In I + II or any other combination of above.

ETIOLOGY OF HÆMORRHAGE INTO OVARIAN

The causes may be classified as follows. given approximately in the order of their importance:

I. Torsion of Pedicle II Associated Conditions.

r Pregnancy. Acts in two ways

a Increases vascularity Favors torsion of pedicle and infection

2 Menstruation a Increases vasculanty.

3 Age "The period of sexual activity" (Daniel) III Regressive Changes for example 1 Rupture of vessel in partition undergoing

absorption 2 Simple necrosis

3 Mahgnant degeneration, s Carcinomatous. Sarcomatous

IV Trauma for example, 1 Blows upon abdomen Incised and other wounds

3 Pressure during examination.

V Sudden Reduction of Intracystic Tension

1. Rupture of cyst a Traumatic.

& Spontaneous 2 Sudden lowering of intra-abdominal pressure, as by obstetrical delivery

3 Tapping VI Increased Blood Pressure

z. Local 2 General

VII Inflammation, especially acute

We will now consider the above outline in detail:

I. Torsion of pedicle A rather extensive discussion of this lesion is necessary because it is by far the most common cause of hamorrhage into ovarian tumors, this accident occurring in about fifty per cent of all cases of torsion. The mechanism of the production of hamorrhage from this cause is readily understood. In the first place, the twist, must not be too great, for this will cut off the circulation entirely in most cases and then gangrene or possibly atrophy will supervene. However, if the pressure caused by the twist is partial or gradual, the veins are obstructed sooner than the arteries, on account of the thinner walls of the former. Thus the blood is dammed back, increasing intravenous pressure till one or more of the weaker veins are ruptured. If the pressure at the pedicle is only slight, merely passive congestion is produced.

slete separation of the pedicle may

happen with or without hæmorrhage, leaving the tumor entirely free in the abdominal cavity (Croft).

The amount of twist necessary to produce serious results varies from ninety degrees to several turns, depending chiefly upon the length of the pedicle, a long pedicle withstanding a larger amount of torsion than a short one.

The frequency of torsion in ovarian tumors is given concisely in the tabulated form shown on page 68.

The averages in this table probably are a little too high on account of the inclusion of Aust-Lawrence's ten cases in which all but one were found to have torsion of the pedicle Preference ought to be given to the figures of McKerron, who has collected by far the largest number of cases, and to those of Williams. who stands next to McKerron in this respect According to both of these men, the average total is too high, and according to Williams the percentage in the child-bearing group ought to be relatively higher. So I have sub tracted two per cent from both the childbearing and the total per cent averages in order to make the conclusions, in all proability, more nearly correct

According to practically all the authorities I have consulted, torsion of the pedicle is more common in cystic than in solid tumors, while Lea and many other writers state that dermoids suffer this accident proportionately more frequently than other cysts. "This is due," says Lea, "to their comparatively small size and slow rate of growth, on account of which they escape notice till pregnancy or some accident occurs "

The percentage of hæmorrhage in cases of torsion is shown by the following table, all of the writers being quoted by Daniel. The relation to child-bearing is not stated; probably all cases, in both the pregnant and the non-pregnant, are included.

Monthon 8 cases Hæmorrhage in 38 per cent Mouls 6 cases Hæmorrhage m 33 per cent Baron 24 cases. Hæmorrhage m 58 per cent Kisseloff 7 cases Hæmorrhage in 43 per cent Aubry . o cases Hæmorrhage in 56 per cent Hæmorrhage in 67 per cent Finaz 20 cases No. not stated Hicmorrhage in 46 per cent Daniel . Total 74 plus

Average 40 per cent

Now if eighteen per cent of all ovarian tumors suffer torsion of the pedicle (see table, p. 68) and if in approximately fifty per cent of the latter, hæmorrhage occurs, the frequency of hamorrhage for all ovarian

tumors with twisted pedicles is nine per cent. In an extensive search of the literature, I am unable to find any statistics concerning the frequency of hæmorrhage independent of torsion of the pedicle. It cannot be said to be very uncommon because I have read many reports of such cases (Libby, Lea, Lance and Theuveny, Davenport, Horsley, Boldt, Haggard, and many others) It probably is safe to assume that three per cent of all hamorrhages occur without twisting of the pedicle. This would make a grand total of twelve per cent of hamorrhage in all kinds of ovarian tumors Furthermore, since hæmorrhage is far more common in cystic than in solid tumors of the ovary, and since nearly nine tenths of all ovarian neoplasms are cysts, these conclusions are approximately correct for cysts alone.

The fifty per cent in which hæmorrhage does not occur are included for the most part in the following groups:

I Torsion not severe enough to produce hæmorrhage

2. Torsion so marked and so sudden that gangrene sets in at once. By far the greater proportion of twisted pedicles in which hæmorrhage does not occur, belongs in this group Very many cases are reported in the literature

3 Pedicle very long so that several twists do not interfere with the circulation. For example, Hammond reports a case in which a "long pedicle contained five twists" and yet there was no hæmorrhage; while Brothers relates an instance in which the pedicle resembled an umbilical cord and was twisted three and a half times, without any evidence of impeded circulation.

4. "Vicarious nutrition from adhesions" (Haggard and others).

5. Unexplained cases in which one naturally expects hæmorrhage but it does not occur.

II. Associated conditions. Pregnancy acts chiefly by predisposing to torsion of the

PERCENTAGE OF TORSION IN OVARIAN TUMORS

	PERCENT	102 01	PERCENTAGE OF TORSION IN UVARIAN LUMORS	IKIAN TUMUKS			
Kind of Tumorr	Authornea	500	In Connection with Child bearing	Independent of Child beams	In Precedult and You Prepared	Relation to Preferency not stated	Total Per Cent
Multilocular ovaman cyst- adenomata	Eyster, G. L.	Not			2		2
Ovazian cysta (All kinds)	Patton C. L.	916	"Compleated by preg-				9 61
Ovarian cysts (All kinds)	Schauta Rokitanchy (Quated by Mand F vy Mand F vy Mand F vy Mand F vy Mand Mand Mand Mand Mand Mand Mand Mand	Jenna 257. others not stated				82025 52	ē
Diaman cysta (Various kinds)	Lea 1 W W		"Dunng pregnancy and				-
Oversan tumors (Mikinds)	Williams bir J	378	Dunng pregnancy, 6				٥
Ovarian cysts (Vanous kinds)	flaggard W D	2		11			=
Ovarian tumors (All kinds)	McKerron, R. G.	8051	Dunng pregnancy," 13				=
	do		"Dunng the puerpenum,"				2
Ovanan systs (All kinds)	Wells, Sychotes	Not		" lade from pregnancy "3			
"Ovarious kinds)	Marshall, G. B.	sc,	Dunny pregnancy, labor, and puesperson, 12 5	"Not compleated by preg			-
"All ovarian tumors"	Schultz (quoted by Davis)						SE SE
Numbs) (Various kinds)	Aust Lawrence	9.	"After labor," 90	"In the non pregnant			917
Total No cases		More than 2769					8
Averages			25	12	2	2	2
Corrected Averages			25	01	2	92	181

pedicle; this occurs most commonly during the puerperium. Numerous explanations have been brought forward as to why this is the case. Davis thinks that the increased romand the lessened intra-abdominal pressure are the chief factors. Movements of intestines, uterus, etc., alone or combined with movements of the whole abdomen and pelvis, probably are causes of more or less importance. The relative frequency of torsion and other accidents during the puerperium is shown by the following statistics from McKerron (all operated cases):

Case, Percent

	Cases,	Per cer
Acute torsion	28	30
Suppuration	10	17
Acute peritoritis	12	13
Rupture of cyst	8	9
Tumor, gangrenous	2	2
Tumor, malignant	2	2
Other conditions	24	36
Total cases	92	

In twenty-nine cases of twisted pedicle of Remy's, eleven were found during pregnancy and eighteen during the puerperium In several hundred cases collected by McKerron, twelve per cent occurred during pregnancy and twenty-two and seven-tenths per cent during the puerperium (See table, p. 68)

Pregnancy predisposes to uncomplicated infection as well as to torsion and its results, hæmorrhage, gangrene, and infection

The influence of menstruation as an etiological factor in producing hæmorrhage into ovarian cysts probably is very small Daniel thinks it acts chiefly by exaggerating or by bringing to light pre-existing lesions However, Boeckel in 1861, described a distinct variety of cysts under the name of "Kystes Menorragiques" The explanation of their formation was that the Graafian follicles do not rupture, at each menstruation one more is added and thus the ovary gradually is transformed into a multilocular cyst ley, Ricketts, and many others have described hæmatomata of the ovary and explained them as unruptured Graafian follicles They occur more frequently with fibroids of the uterus than with any other pelvic lesion

As to age, cysts and other tumors of the ovary occur now and then in girls and they have been reported even in infants; also, they

are found in those past middle life and among the aged; but probably about ninety per cent of them occur during the period of sexual activity, that is, from twenty to forty-five or filty.

III. Regressive changes. Although about twenty per cent of all ovarian tumors are maignant and although hemorrhages from this cause are not uncommon, yet they are usually small and inconsequential.

IV. Trauma Now and then cases of rupture and harmorrhage, one or both, are reported due to such accidents as falling from a stepladder (Le Conte), striking against a chair, etc Dr W. E Morgan, of Chicago, has related to me in personal conversation a case in which he ruptured a cyst while making a bimanual examination. There was no till result to the patient, in fact, as far as he ever was able to ascertain, the cyst never reformed.

V Sudden reduction of intracystic tension. This is caused most frequently by rupture or puncture of the cyst or by lessening of intraabdominal tension through delivery of a baby. In this category comes the case described at the beginning of this article Fig 2 is a diagram illustrating the mechanism in this case, a, b, c, d, e, represents the outline of the tumor when compressed by the gravid uterus. When the latter was emptied, the side a b c. being relieved from this pressure, moved in the direction indicated by the arrow, assuming the position a b c, thus greatly increasing the intracystic capacity and correspondingly lowering the intracystic tension. The walls of one or more veins gave way and thus the hæmorrhage occurred.

VI Increased blood pressure. Mere raising of the pressure of the blood alone is more a theoretical than an actually demonstrable cause

VII Inflammation This is a comparatively rare cause, as far as the writer is able to ascertain.

Histogenesis of warten cysts. They arise usually either from the parovarium or from the ovary itself. The origin of ovarian cystadenomata (like the author's case) is a much discussed question. According to the researches of Clark and others, cysts of this latter type spring from the remains of the

secreting tubules of the Wolffian body left imbedded in the base of the ovary. The evidence in favor of this theory seems to be very conclusive indeed. However, it is too far from the object of this article to go into details concerning this subject; therefore, I will reserve for a future paper a description of my investigations along this line.

PATHOLOGICAL ANATOMY

This has been described to a large extent under etiology Further facts ought to be stated as follows.

- 1 Circulatory changes (Edematous swelling is encountered very frequently, as a result of either twisted pedicle or inflammation. The color in this condition ranges all the way from ted to dark blue, the latter predominating. The shape of the eyst is sphroidal and the consistency rather soft, unless the fluid is under great tension, in which case the cyst is hard to the touch.
- 2 Inflammation A mild pericystic inflammation producing adhesions to the surrounding structures is a practically constant tuding Purulent inflammation within the cyst is not uncommon, but primary hamotrhagic and rangemous inflammations are rare
- 3 Regressite changes Ovarian tumoshave been known to decreave in alse spontaneously (Williams); but this change is rare. The most common finding along this line is angrene, due usually to to-sion of the pedicle According to T. J. Watkins, however, gan green enver superviews after torsion without bacterial infection. He says, "If there are no bacteria we get no engineere.
- no internal we can be supported in simply attrophy. The color of the gangerious cyst is black or bluish black. Or course, with inflammation, we find all of the regressive changes which occur usually with that process Cases of malagnant degeneration are common, constituting probably about twenty per cent of all oxarian tumors. Harmorrhage of clinical significance in them, however, is rare
- 4 Progressive changes Nearly all ovarian tumors, especially cysts, have a tendency sooner or later to increase in size—they are decidedly neoplastic in their nature Shenck, Williams, Spencer and most other writers

maintain that pregnancy does not cause an ovarian tumor to increase rapidly in size. As to the effect of pregnancy in causing malignant degeneration, there is a division of opinion. Lotheri and Oh-haisen (both quoted by Schenck) and Wernich and Leopold (both quoted by Williams) believe that pregnancy does predispose very markedly to malignant degeneration Williams, however, holds the opposite view, basing his conclusions in a very logical manner upon a large number of collected caes and a rich personal experience.

Mere increase in size may be due to redema, hæmorrhage, inflammation, imple growth or malignant growth, each alone or in combination with one or more of the others

TREATMENT

The following table (p. 71) gives in a contise manner the results of the various methods of treating ovarian tumors.

As a summary of this table, we find that obstetrical operations (usually without previous removal of the tumor) have the highest mortality of any method of procedure, namely thrty-nine per cent; tapping has twenty nine per cent; expectant treatment, twenty-five per cent, while oarnitomy has only four and seven tenths per cent. These figures taken together with the fact that the fetall mortality is probably lower (at least not higher) in ovariously than in the other methods, tell their own story.

The publications on which the above statistics are based all appeared during the last fifteen years. The oldest one is that of Williams 1807

According to Dsirne, in 1892, the high mortality of ovariotomy in earlier days had been reduced to about six per cent

It must be noted that the mortality of four and seven tenths per cent for oxariotomy given above includes complicated cases. In simple cases (during pregnancy) McKerron in 1903 gave the mortality as about two per cent. At present, it probably is less than one per cent

Ovariotomy then is the treatment par excellence for ovarian tumors, no matter what their relation to pregnancy (one exception to be mentioned later); for this method

TREATMENT OF OVARIAN CYSTS

Percentage

Kind of Treatment	Relation to Preguancy		Per- centage Mater- nal Mortal- sty	Inter- rupted Pregnancy or Child Mortality	Authority	No. o Case
	During pregnancy, labor and pu perium	ier-	21	30	McKerron	720
EXPECTANT	Before labor		26	19	Patton	95
	Post partum		28	Not stated	McKerron	Not state
Average mortality			25	19		
TAPPING OR PUNCTURE	Before labor		39	59	Patton	31
	During labor		29	т8	Marshall	56
			26	Not stated	Williams	Not stated
	During pregnancy, labor and puer- perium		23 5	30	McKerron	5r
		_	Not stated	45	11	75
Average moriality			29	43		
OBSTETRICAL OPERATIONS— "Artificial delivery"		1	49	Not stated	McKerron	49
Forceps			26	"	Williams	Not stated
Version		<u>,</u>	26	44	"	d
Cramotomy	Without previous removal of tumor	During Labor	44	11	"	41
C≋sarean section		II.	90	44	44	tt
	ì '	"	- 8	.4	Lea	12
Reposition of timor			80	"	McKerron	10
reposition of timot			Г2	"	46	41
Average mortality		느	15	13	Marshall	6r
Ovariotomy-		_	39			
			٥	Not stated	McKerron	3
Kind of ovariotomy not stated	During labor		10	и	Williams	Not stated
Abdominal, 8, Vaginal, 7		- 1	_°	17	Marshall	16
	Potential		°	Not stated	McKerron	15
Abdominal "Operations"	Before labor	_	43	19	Patton	184
Accrage mortality	During puerperium		14	Not stated	Mckerron	92
Activity	<u> </u>	- 1	4 7	18		$\overline{}$

has a mortality far below that of any other kind of treatment.

It is interesting to note how formerly this operation had a very high mortality. For example, 1,000 cases of ovariotomy performed by Wells, from 1858–1850, gave a mortality of twenty-two and five-tenths per cent. Nevertheless, about 1877, this became an established method of treatment, due more to the efforts of Wells than to those of any other man.

Cæsarean section does not have a fair show in the preceding table. With modern technique and undertaken early, it is one of the very best methods to apply in connection with certain ovarian cysts complicating preg-

nancy at or near term It is indicated especially in two classes of cases; first, in those where the tumor is impacted in the pelvis and can not be disloged by ovariotomy; secondly, in instances where, though the tumor has been remode, there is doubt as to the facility with which the child can be delivered per vias naturales

Forceps, version and craniotomy are particularly deadly procedures if undertaken without previous removal of the tumor Version

especially is to be avoided. "Tapping should be employed," McKerron very rightly maintains, "only to relieve symptoms due to distention" or as a temporary measure to facilitate delivery, if the cyst is impacted in the pelvis and is preventing the descent of the child Furthermore, tapping or reposition may be resorted to usually only on condition that the tumor be extirpated within twenty-four hours (never more than one to two weeks) after delivery patient in no case should be advised to wait a long time, say till the baby is weaned, before she has the tumor removed Statistics show that such a delay is altogether too hazardous, giving a far higher mortality than early ovariotomy.

As to expectant treatment, Schenck, Barrett and many others think that it has no place in handling ovarian cysts. They bold that operation is indicated at once, whenever an ovarian tumor is discovered, provided, of course, that there are no contra-indications to a major operation. This attitude, which is prevalent especially in America, should be modified, I think, by the fact universally accepted that interruption of pregnancy from operation is much more likely to occur during the latter half than during the first half of pregnancy. Hence, Spencer and other English authorities advise waiting at least till the child is viable before operating, if the tumor is not discovered till after the fifth or the sixth month, unless, of course, the condition of the mother is urgent. By following this course, very likely the percentage of interruptions of pregnancy will be reduced without materially increasing the maternal mortality.

Small tumors of the overy should never be treated expectantly because of their diminutiveness, for these are just as apt to give trouble as the larger ones

SUMMARY

I Etiology and pathology. Ovarian cysts almost always produce serious trouble sooner or later and especially during pregnancy, labor, and the puerperium. The most dangerous period is the puerperium Torsion of the pedicle is the most common accident with its resultant hamorrhage, gangrene, and infection The most frequent result of twisted pedicle is hæmorrhage, which occurs in about fifty per cent of all cases of torsion Hæmorrhage from all causes occurs in about twelve per cent of all ovarian tumors, in both the pregnant and the nonpregnant, nine per cent in the former and about three per cent in the latter Though the multilocular cystadenoma is the most common cyst of the ovary yet dermoids seem to produce serious

trouble proportionately more frequently.

2 Treatment The tendency of ovarian
tumors is almost always to increase in size
more or less and also sooner or later to undergo
torsion, hæmorrhage, gangrene, infection or
malignant degeneration Hence in general,
these cysts should be removed as soon as
possible after they are discovered. One
should usually be particularly careful not to
let a woman pass into the puerperium without first ridding her of the cyst

Most dinicians maintain that an ovarian tumor in most cases should be removed as soon as it is found. Exception may be made to this rule in case the tumor is not discovered till after the fifth or the sixth month of pregnancy. One then frequently is justified

in waiting till the child is viable.

As to the choice of treatment, there usually is no room for doubt. So-called expectant treatment in most cases amounts to practically no treatment at all. Aspiration has a very high mortality. Obstetrical operations have an enormous mortality, unless the obstructing tumor is removed before they are undertaken. Ovariotomy (usually abdominal) has a mortality far less than any other procedure (less than five per cent of all cases). Cæsarean section, if undertaken early, is an excellent procedure in certain cases. I can conclude best with the words of McKerron, which are more pertinent today than they were nearly ten years ago when he wrote them: "All the available evidence points to the advisability of early operation" (ovariotomy).

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MECKEL'S DIVERTICULUM

WITH RAPORT OF FOUR CASES

BY I R WELLINGTON, M. D., WASHINGTON, D. C. Citatest Professor of Surgers George Washington Upwermty Medical School, Attending Surgeon Garbeld, Children a and Casually Hospitals

N 1812, John Frederick Meckel first accurately described the diverticulum which now bears his name, although its existence had been referred to in medical literature many years carlier.

While this abnormality is present in only about two per cent of the human race, it is of considerable surgical interest on account of the great variety of pathological lesions to which it may give rise and the impossibility of diagnosing its presence as the causative factor

In order to fully understand the pathology of this condition, we must turn to the study of feetal development. Embryologists tell us that in the beginning of fcetal life the middle portion of the primitive gut, or the midgut, is connected to the yolk sac by a wide canal, called the vitelline duct This duct is accompanied by an artery and two veins, which maintain the circulation between the volk sac and the intestine. At the end of a few weeks, this vitelline duct becomes functionless, and under normal condition entirely disappears, the atrophy beginning at the distal end The vessels disappear at the same time, except that portion in the mesentery, which persists and eventually forms

the superior mesenteric artery and vein. In two per cent of human beings this atrophy is not complete, and varying portions of this duct may remain, and it is this remnant of feetal life which is known as Meckel's diverticulum. Likewise the vessels, although functionless, may persist as a cord running from the end of the diverticulum to the umhilicus, or its distal end may be attached to the abdominal wall, the mesentery or any other organ, or its end may be free. It is this cord that is so frequently the offending agent in the production of obstruction.

The diverticulum may be found in any part of the jejunum or ileum, but in most cases in the last two or three feet of the ileum.

Diverticula of the duodenum are of an entirely different origin, as this part of the intestine does not develop from the mid-gut. Its point of attachment to the ileum is nearly always opposite the mesentery, although occasionally it may be lateral or even close to the mesentery.

Its opening into the bowel is usually equal is size to the lumen of the bowel itself, but it is sometimes restricted by a valve-like projection of mucous membrane. Although somewhat thinner, its structure is similar to the intestine, even to the existence of Peyer's natches

The diverticulum may have a mesentery of its own attached to that of the bowel from which it arises. It is believed that this mesentery may undergo atrophy, leaving only a fibrous band, which accounts for the frequency with which a cord is found extending from the side of the diverticulum to the root of the mesentery

In shape it is usually conical, although this is by no means constant, as it may be found bulbous, hammer-shaped or even spherical from a constriction of its base

As a rule, its length varies from a mere projection to six or eight inches, and a case of Pollard's is cited by Turner where it was thirty-six inches long. The average length is about two or three inches

Its location in the abdomen naturally varies, depending upon its point of origin and the mobility of the ileum, but in most cases it is found in the right side, which accounts for the frequency with which lesions of this structure are confused with appendicitis

For some reason which it is impossible to explain, Meckel's diverticulum is more common in males than females in about a ratio of three to one. The diagnosis of the presence of this structure either in health or disease is absolutely impossible, except in those cases where it remains patulous at the unbilicus.

When it is present, its existence is believed

by Fitz to be a greater menace to its possessor than an appendix, on account of the very serious lesions to which it may give rise.

The relative infrequency of the occurrence of disease of Meckel's diverticulum is shown in figures of Balfour (2), who reports fifteen cases in 10,600 abdominal operations in the Mayo clinic, and in only five of these was it the cause of the operation. In the other ten cases, the diverticulum was found in the course of operation for other conditions and was removed. In a few of these, pathological changes were noted

It is undoubtedly advisable to remove a Meckel's diverticulum whenever found, unless the exigencies of the case absolutely prevent. In its removal, if the base is small, a pursestring suture may be used, as with the appendix, but more frequently it will be necessary to employ rows of Lembert sutures, or even to-creet the intestine to prevent constriction.

The following four cases have come under my care, all between the years 1907 and 1910:

Cast 1 White man, age 50, seen on May 11. 1007, in consultation with Dr I rischkorn He gave a history of an acute abdominal crisis of two days' duration, with abdominal pain, persistent vomiting, constipation and some distention. The rigidity was more noticeable over the right rectus A diagnosis of probable appendicitis with paralytic ileus was made The leucocytes were 7,400. Operation revealed a loop of bowel about one foot long, distended and deeply injected, which was constricted by a Meckel's diverticulum from the tip of which was a cord running to the umbilious. The diverticulum was removed, and the stump inverted. There was considerable free fluid in the abdomen It was thought that a resection was unnecessary, and the abdomen was closed with drainage A few days later he developed a facal fistula. Although his bowels moved freely and there was no evidence of obstruction, his condition gradually grew worse and he died sixteen days after the operation.

Case ? White boy, aged ?, was brought to Children's Hospital November 23, 1908, with a history that since buth I here had been a discharge of mucas from the umblates. The mother stated that when boy was six weeks old; there had been a sloughing of the entire navel. Upon admission aboughing of the entire navel. Upon admission was aboughing of the entire navel. Upon admission was a very small probe showed a fastual the most and a very small probe showed a fastual the most and the umblicus and the fistulous tract. It was then found that it connected with a small pathous cord ranning to the tip of a Meckel's diverticulum This latter process was about one inch long and

attached to the ilcum opposite the mesentery. The diverticulum was removed, and the opening turned in by a purse-string suture. He made a good re-

CASE 3 White male, age 48, admitted to George Washington Hospital on March 5, 1909, to the service of Dr Ruftin lle gave a history of having had cramps in abdomen for the past three weeks Three days before admission, he had a chill followed by several vomiting attacks During the first three days in the hospital, his temperature did not go above 100°, pulse normal, leucocytes 16,000 had some abdominal pain, and there was a distinct right rectus rigidity. A diagnosis of appendicitis was made Operation revealed a normal appendix but a gangrenous Meckel's diverticulum about one foot above ilco-cæcal valve. There was some localized peritonitis The diverticulum was removed, the stump turned in and the abdomen closed with drainage. The diverticulum in this case was about three inches lone, with a free end Although this nationt's bowels moved freely and there was very little distention, he began vomiting shortly after the operation and this persisted until

his death, three days later CASE 4 White male, age 55, a patient of Dr Ruffin's, was first seen by him on July 8, rgio lle gave a history of having had great pain in right side of abdomen near the umbilious for past thirty-six hours He was sent to George Washington Hospital, where I first saw him at six P u of the same day His temperature was 99 4, pulse 90, leuco-cytes 16,500, urine normal He had marked rigidity and tenderness just to the right of the umbilicus There was no nausea or vomsting This was thought to be probably an appendicus, al though the location of the pain and lenderness should have been suggestive of diverticulities incision was made through the right rectus on a level with the navel Upon separating a mass of omental adhesions an acutely inflamed Meckel's diverticulum about two and one half inches lone and nearly the diameter of the small bonel was disclosed. One point near the base seemed about to perforate The diverticulum was removed and the hole in the bowel was closed with two rows of Lembert sutures The appendix, which had become slightly inflamed from continuity was removed. The abdomen was closed with drainage This patient made a slow but good recovery Upon examining the specimen, it was found to contain the breast bone of a small fowl one prong of which had nearly perforated When questioned later, he re membered that while eating a squab two weeks previously, he had realized that he had smallowed a piece of bone, but had given it no more thought

In a fairly careful search of the literature I have been able to collect 326 cases of disease, involving Meckel's diverticulum This does not include cases recorded where it was found post-mortem or in the course of other

operations, and was not itself involved. One can better realize the great variety of abdominal crises to which this process may give rise, by observing the pathological lesions found in these 326 cases.

There were 144 cases of intestinal obstruction (intussusception and volvulus not included); 59 of intussusception; 50 of acute diverticulitis: 27 of hernia: 21 in which the diverticulum was open at the umbilicus; o of volvulus; 6 of perforation in typhoid; 2 of perforation from trauma: 2 of tubercular ulceration; 3 of prolapse of bowel; and 1 each of pelvic tumor, perforating ulcer, and cyst,

Of these cases, 201 were males and 64 females and in 61 the sex was not given. The ratio of males to females was a little more than 3 to 1. Of the 326 cases, 175 died, 129

recovered and in 21 the result was not stated. To consider the statistics in detail, we find there were 144, or 44 per cent, of intestinal obstruction. Halstead (2) estimates that 6 per cent of all cases of obstruction are due to a Meckel's diverticulum. Eisendrath (4) has very well discussed the mechanism by which obstruction is brought about. Suffice it to say that in most eases, it is due to the presence of a cord extending from the tip of the diverticulum to its attachment upon some other part of the abdomen. In about one third of the cases, this cord when present is attached to the umbilicus. In quite a percentage of cases, it is attached to the mesentery and abdominal wall and less frequently to other structures It is supposed that this cord in some way becomes freed from the umbilicus and then by inflammation or otherwise becomes fixed to other parts Gilbert (5) reports a case dying from obstruction without operation, in which, at autopsy, this cord was found to have encircled the bowel one and one half times through a hole in the mesentery

Of the 144 cases of obstruction, 108 were operated with 50 deaths and 52 recoveries, and in 6 the result was not stated. Of the 28 cases not operated upon, all died. The treatment in the other 8 cases is not mentioned The operation consisted of a resection of the bowel in 11 cases, with 7 deaths and 4 recoveries, of a removal of the diverticulum in 52 cases, with 17 deaths and 33 recoveries, and in 2 the result is not stated; in 22 cases, the offending hand was simply cut, resulting in 9 deaths and 11 recoveries, and in 2 the result is not given; in 3 an enter-onterostomy was done with two deaths and one recovery; in one fatal case the bowel was stitched to the abdominal wall.

Intussusception is comparatively common, occurring 50 times in this series. It can be readily understood, that, given a comparatively short, conical diverticulum without attachment, it might easily become inverted and act as a polypus in causing an intussusception. The youngest case was five months, and the oldest sixty years, and while intussusception under ordinary conditions occurs in a large proportion of cases during the first two years, only ten per cent in this series occurred during that period. The average age of the intussusception cases was 14 years Turner (1) reports an interesting case of a male child sixteen months old operated upon by Mr. Lane, who found an intussusception in the right iliac region; this was reduced and a second found, this was reduced and found to contain a third, and the last contained an inverted diverticulum Of the 59 cases, 44 were operated upon with 24 deaths and 20 recoveries. Fourteen cases were not operated upon, with nine deaths, one recovery from sloughing of the intussusceptum, and in four the result was not stated The treatment in one case was not mentioned.

Diverticulitis symptomatically and pathologically closely resembles appendicitis, for which in nearly every instance it was mistaken. Among the fifty cases, there were all degrees of severity from the mild catarrhal to the gangrenous with general peritonitis Most of the cases were acute, and chronic diverticulitis would appear to be less common relatively than chronic appendicitis Because of the large opening into the intestine, a diverticulum is more liable to be the lodging place of foreign bodies than is the appendix, and these were the exciting cause in fifteen of these cases. Nearly every foreign body that could gain entrance to the intestines has been found. Enteroliths, gallstones, seeds, pins, bones, etc. have been

noted. Peck (6) reports a case with symptoms of partial obstruction and at operation a Murphy button, which had been employed three years previously in a gastro-enterostomy, was found just below a Meckel's diverticulum Peck believes that the button had been lodged in the diverticulum and had just passed into the bowel, giving rise to symptoms for the first time. While the large opening renders a diverticulum more liable to the lodgment of foreign bodies, at the same time it offers a free exit for the secretion and this is undoubtedly a prominent factor in explaining the infrequency of diverticulitis as compared with appendicitis.

The mortality in acute diverticulitis is forty per cent. This high death rate compared to that in appendicitis is probably due to the greater liability to early perforation, the frequent involvement of the bowel, the greater mechanical difficulty in its removal, and the less tendency to localization of the infection.

The 21 cases of persistent umbilical fistula presented all degrees from minute opening with a slight mucous discharge to those in which the whole intestinal contents were emptied through the umbilicus. It is frequently associated with a polypoid growth or there may be a prolapse of the mucous membrane of the diverticulum. Many of the milder cases are probably never diagnosed, as they may heal spontaneously or by the use of the actual cautery. The congenital facal fistulæ are undoubtedly due to a Meckel's diverticulum emptying into the umbilical cord, or even protruding into the cord and being ligated with it, the diagnosis not being apparent until the separation of the cord takes place. Of these 21 cases, 16 were operated upon with only r death. The treatment in 5 cases was not mentioned.

There were 27 cases in which a Meckel's diverticulum formed a part of the contents of a hernia. Of these, 12 were inguinal, ro umbilical, 2 femoral, 2 scrotal and one not stated. Many of these were strangulated and in a few the diverticulum alone was found at operation.

Nine cases of volvulus were found. It can he readily understood how a long diverticulum starting from the side of the small inattached to the ilcum opposite the mesentery. The diverticulum was removed, and the opening turned in by a purse-string suture. He made a good recovery

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DEPARTMENT OF TECHNIQUE

A CASE OF CARCINOMA OF THE BLADDER CONTROLLED BY THE HIGH FREQUENCY CURRENT

BY EDWARD L KEYES, JE. M. D. NEW YORK CITY

I N spite of all that modern surgery has done toward radical removal of malignant growths, in spite of the many lasting cures that have undoubtedly been achieved, the general public continue to believe these tumors incurable by any operation Such an attitude is both unwarranted and reprehensible Yet it is founded upon the observation of many post-operative recurrences of cancer, each one of which leaves a terrible impression upon the imagination of the sufferer's friends and relatives, an impression not to be effaced by any number of cures.

But before we reprehend too sharply the uninformed layman whose ignorance as to the surgical cure of cancer often encourages that delay which is the very source of our failures, we should perhaps clear up our own theories a bit For we, too, may be misled as to the malignancy of carcinomatous growths and from the very same observation of post-operative recurrences that forms a basis for the skepticism of the layman, we may conclude not only the truth that successful surgery requires earlier diagnosis of malignant growths, but also the falsehood that wide surgical removal of the growth with the surrounding apparently healthy tissue is the only cure for any

catcinoma. We must face the facts, we must recognize that what the curette and arsenic have done for certain malignant neoplasms of the skin, radium and the X-ray are doing for more malignant growths in accessible situations Indeed, while we still await the specific poison for carcinoma that shall replace cautery and knife alike, we must open our ears to the claims of each of these, and recognize that the great superiority of the knife lies in its ability to reach the depths discased, while the various cauterizing agencies are efficient only in the treatment of superficial and accessible lesions.

Now, to turn from the general to the particular, bladder growths have only recently been made accessible to cauterization through modern opera-

tive improvements in cystoscopic technique, of which the most important is the application of the Oudin current according to the method of Beer. We have learned that this treatment is well qualified to compete with the knife in the treatment of benign papilloma of the bladder, but how far it may be depended upon to treat beginning papillary carcinoma - that condition which in its incipiency is confusing to pathologist and surgeon alike - we do not yet know. As an item in the determination of this question I submit the following case, the first phases of which have been previously reported.

The patient, a stout, sedentary man, 61 years of age, consulted me first on July 30, 1900 He gave a history of glycosuma and constant marked arterial tension (200 or over) for several years previously. Two months before seeing me he first noticed a spontaneous, profuse, total hæmaturia and since that time he had seen blood in his unne almost every day. I cystoscoped him and found a small villous growth just back of the right ureter.

On October ad I removed this growth through a suprapubic opening, cutting it away with an elliptical area of apparently normal mucosa about its base. Except for a post-operative pneumonia, which nearly carried him off, convalescence was uneventful, but the specimen, submitted to pathological examination, showed carcinomatous infiltration up to the cut edge of the apparently normal mucosa (Figure 1)

November 20, 1909 Three and a half months having intervened since the operation, I cystoscoped the nationt in the presence of Dr Van Riempet, and saw a small papillary growth at the scar This I burned with the D'Arsonval current.

March 12, 1910. In the presence of Dr. Beer and Dr. Barringer I again burned with D'Arsonval current. The

tumor on this occasion looked about as it had four months before On April 2, 1910, and April 23, 1910, I again burned with

the D'Arsonval current

May 14th The original tumor had disappeared, but three small villoos tufts were seen upon the vault of the bladder; two of these I burned with the Oudin current, October 15th A fifth recurrence in the shape of a small villous growth in the roof of the prostatic urethra was

burned through the urethroscope with the Oudin current. January 7, 1981. In the presence of Drs Cabot, Smith Connors, and Barringer I burned with the Oudin current the third tumor in the vault of the bladder, which had not yet been burned, and also the tumor at the uneteral

onfice, which had been burned once previously.

January 28th Both these tumors were burned again.

October 26th Cystoscopy showed no trace of any of
the four tumors within the bladder, but a small villous
growth within the urethra This was burned with the

Oudin current.

Meanwhile the patient had undergone various vicissitudes, mentally and physically, due to his high blood

pressure and sugar

80

On December 11, 1911, he died of acute dilalation of the heart. No autopsy.

The history of this case may be summed up as follows:

A small papillary growth was removed from the bladder and proveo carcinomatous by pathological examination. It recurred, as was to be expected, but was apparently curred by four burns with the D'Arsonval current, and is known not to have relapsed from April 23, 1910, to October 26, 1911.

In the meanwhile four other growths of similar character appeared These were all burned with the Oudin current. Two of them were cured by a single hurn on May 1s, 1910, one by two burns io January, 1911, and the cures were cystoscopically verified on October 26, 1911. The foff-th tumor was burned four times and the patient was not cystoscoped after the last burn

Thus we have a known carcinoma apparently cured for eighteen months, two recurrences in other parts of the bladder cored 17 months, one cured 9 months and one of which the cure was

not verified.

I may add that, inasmuch as the patient continued to gain weight from the time of his operation up to the time of his death, it is to be presumed that there were no carcinomatous meta-

Philifer

stoses. Although so brief a history, unfortified by post-mortem examination, can give us no certainty that the tumor was cured, it is oevertheless striking evidence of complete control of a small carcinoma for a considerable number of months, and while my own experience does not offer any comparable case, I have in two or three instances, by means of the high frequency current, cleared the bladder of tumors whose hardness, as determined by contact with the ureter catheter and the electric wire, was very suggestive of mahgnancy; moreover I am now treating a patient, 80 years of age, who after more than two years of more or less interrupted burning of his bladder tumor, exhibits an irregularly infiltrated area from which great masses of papillomatous tissue have been burned away. He is no longer distressed by the hæmaturia from which he suffered for eight years, before these tumors were burned.

and his general condition is excellent. No doubt such a tumor must be malignant, yet not only are we bolding it in check, but, on the whole, we are rather getting the better of it.

On the other hand, every one who has experimented with this method of treating bladder tumors must be impressed by certain clinical characteristics wherehy the tumors intractable to cauterization may be distinguished from those

likely to yield to it.

Let us put aside for a moment the arid discus-

sion of what is and what is not true carcinoma. and discuss in terms of therapeuties what is and what is not the tumor amenable to intravesical cauterization - the malignant tumor in the true sense of the word. The discussion is an ancient The reiteration of its details would not interest you. But the struggle of the pathologists to discover an incipient carcinomatous focus that may lie hidden in an excised papilloma is no longer the chief point at issue. The clinical question is now the more important, and we must attempt to determine the limitations of intravesical cauterization, so as to he prepared, oot only to treat in this manner as many patients as possible, but also to avoid disastrous delay from neglect of radical surgery in favor of futile

My own experience has furnished four clinical points:

1. Hardness of the tumors.

burning.

2. Multiplicity and size of tumors

3. Sloughing of the surface of tumors

4. Iotractable cystlifs.

Hardness of Tumors After a little experience
one readily recognizes in certain tumors the
evistence of a hard, more or less pedunculated
mass against which the electric wire strikes as
it passes among the villi. Such tumors are
relatively resistent to burning, yet, as stated
above, some of them can certainly be controlled
by this method. I have not had the opportunity
of hurning the small hard infinitated ulver, so
characteristic of certainoms. In papilled, we
characteristic of certainoms. In papilled, the
electric of the controlled of the certain of the certain
by cystlosopy, but a tumor whose
indurated base can be felt by rectal touch is
interrable by burning.

Size and Multiplicity of Tumors.—Several tumors, so large that their size could not be accurately estimated by cystoscopy, have been successfully destroyed by burning, and in several instances multiple tumors have been burned away. I have not seen any case in which size

*I moted the last time I crystoscoped him, six weeks after this was written that every troce of the numer had disapprared



Fig. 1 Section from apparently normal mucosa. The carcinomatous infiltration occupies the very bottom of the picture.

and multiplicity were decisive elements in deciding against local treatment and in favor of operation. Yet the larger and more numerous the growths, the more likely are we to find, when we have burned them away, an infiltrated base which forbids the hope of cure by burning.

Slonghing Surface of Tutmors — Small hæmorthagic and slonghing spots upon the surface of an otherwise villous tumor do not necessarily indicate malignancy, but I have never yet been in the least successful in burning any tumor covered with an extensive sloughing area

Intraciable Cystitis — The most striking contra-andication to cautenzation, however, is severe intractable cystitis. It is, of course, not impossible that the most benign papilloma should be complicated by severe cystitis. Yet it has been my expenence that cystitis, occurring in the presence of a bladder growth curable by cauterization, is itself more or less readily releved by irrigation of the bladder, while acute cystitis, causing intense frequency and pain on unnation, contra-indicates cauterization, not only because of the pain excited by ever cystoscopy, but also in virtue of the fact that the tumors in such cases do not appear to yield to this treatment.

Such are the features indicative of clinical mahignancy which the cauterization of bladder tumors has yielded to my observation up to the present time

CLAWFOOT, AND HOW TO RELIEVE IT

BY A MACKLYZIC FORBES, M D C M., MONTREAL Surgeon in charge Children a Memorial Hospital Surgeon in charge Children a Memorial Hospital Surgeon in charge Orthopardics Montreal General Hospital, Lecturer on Orthopardic Surgery

McGill University

THERE is a common deformity of the foot which is not usually described in text and which others have called "clawfoot," and which others have called pes cavus, and by a variety of names

This deformity is characterized by a fore shortening of the foot with contraction of the plantar fascia, causing cavis, by a tonic contraction or permanent shortening of the extensor muscles and tendons, causing hyperextension or perhaps even dorsal subluvation of the toes, which contraction causes, or is accompanied by, a depression of the metatiasal heads, much as is seen in anterior metatiasalga. These depressed heads, by impiging on the soft tissues of the sole of the foot, cause discomfort, callostites, and sometimes even pain of so secree a nature that walking may be rendered difficult of impossible This condition is often confounded with clubtoot. It differs from it, however, in two ways First, "clawloot" is not characterized by marked varus, which is the characterized deformity of clubloot. Second, 'clawfoot' is never congenital, whereas clubfoot is often, or I might say nearly always, a congenital deformity. The onset of "clawfoot." is insideous and so is its development. The tendency to this deformity may noticed shortly after birth, but the complete deformity—the foreshortened foot with cavus and hyperectension of the toes—is rarely, in my experience never, noted at the time of birth.

It is interesting to study radiograms of feet of those suffering from this deformity. The hyperextension of the toes, the tendency to dorsal subluxation, and the increased arch already spoken of are all demonstrated.

The cause of this deformity is not generally



Fig. 1.—Skingram of look of princip who is suffering from "cloudow." This demonstrates that the first included from in this patient is depressed anierosely and that the proximal philana arrivalates principally with the dorsal surface of this long. The front is seen to be foreshortened.

known. Some say that it is due to anterior printermitate. Others say that it is due to the shortening of the plantar fascia, again others say that it is due to a shortening of the extension muscles, and others, to a paralysis of the paronet Which theory right? I am include to the size that it is some cases this deformity may be due to ome of three causes offent it may be due to a combination of three and perhaps sometimes it is due to above a the foot by warring mosfitting

The treatment of this condition is worthy of consideration. Many operations have been devised for its relief. Included amongst these are plantar fascintomy, subcutaments division of the extensor tending, and exchange, and pirhaps most radical of all is the operation which I believe is used by Mr. Robert Jones of Liverpool in intractable cases, viz. the excision of each metaarsal head and the astrangues.

Two years ago, at a meeting of the American Orhopscule Association, I suggested that the most rational operation for the relief of this condition was an operation smaller to that devised by most for the relief of anti-for intertaintsalign. Since then I have made use of this method with such pleasing results, that I take this opportunity of draming the attention of recent surgeous to it

My procedure has been to transplant the common extensor tendons into the heads of the metatarsal bones, after having detached them from their insertions into the phalanges. This is done in the belief that the common extensors, while maintaining the phalanges in a position of

'Am J Orth Surg February 1015

hyperextension, are acting as a power for positive evil. It is done also to family a mean of support for the depressed leads of the metalarsal bones burly if the common extensor is strong arough to be responsible, or even partly responsible, for even partly responsible to the position of deformity as is demonstrated by the position of the phalinges in the accompanying radiograms, it ought to be a valuable and in maintaining the depressed metalarsal heads in a position nearer to the normal. I think, then, that we can thus transplant the common extensor and the extensor longue hallues in perfect confidence that the extensor longue hallues in perfect confidence that the extensor longue hallues in perfect confidence that the extensor longue hallues he toes in a position extensor longue hallues in the toes in a position.

miduay between extension and flexion The operation is a difficult one, because the perso-teum of the middle metatarsals is not strong enough to be made use of as anchorage for the transplanted tendens, and because they are so deeply placed that it is often difficult to get anchorage by drilling through the necks of these bones, but by strong pressure exerted beneath, we may so raise these that, if we cannot bore transversely through the necks we can at least here obliquely from each side to a common place of meeting, or, again, we may manage to insinmate a salk ligature around the metatarsal This can be best done after the method adopted by B P. MacKenzie of Toronto in various tendon transplantations. The principle of this is to carry the ligature from the dorsal to the plantar surface of the foot by means of a needle, which is made to hug the neck of the metatarsal bone. The figature is then returned from the plantar to the dorsal surface of the foot by inserting the threaded



Fig. 3. Shingram of patient No. 1 taken three weeks after the operation. This demonstrates the engithering of the foot by the transplantation of the extensor longus politics, in the manner described in the text. This demonstrates also that an obsertionary has been performed near the base of the first metatassal bone. Marked improvement has resulted,

needle into the same perforation of the plantar skin as that through which it made its evt. It is then made to hug the opposite side of the metatersal bone, and is drawn out of almost the same spot as that on the dorsal surface into which it was originally thrust. This scheme has the disadvantage of constricting the soft parts of the plantar surface and of leaving the skin of that surface puckered in much the same way as is done by the matterss maker.

The operation which I bring to your notice is performed through a horse-bee shaped meision on the dotsal surface of the foot. This finesson is, however, preceded by a subcutaneous plantar lascotomy, with wrenching if necessary. The mission is carried to the extensor tendons, and a flap containing all the tissues superficial to these turned back onto the dorsal surface of the tarsometataesal articulation. The long extensor tendons are then detached from the phalagrand transplanted into the necks of the metatar sals in either of the methad surgested. The salk

attachments are then buried as deeply as possible by means of fine catgut sutures, and the skin flap returned and sewed into place by means of horsehair

This operation should be sufficient to relieve the majority of patients suffering from this deformity, but if, on our first examination of the patient, it is felt that the arch of the foot has been so greatly increased that the transplantation of the extensors cannot be expected to undo the damage done, by possibly years of malnosition. it may be wise to perform a wedge shaped osteotomy through the dorsal surface of as many of the metatarsal hones as have caused callosities on the plantar surface of the foot The removal of such wedges, with their bases situated on the dorsal surface of the metatarsal bones, if accompamed by a careful plantar fasciotomy, and especially if followed by careful after-treatment. cannot fail to lengthen the foot and to remove all sources of pressure if a transplantation of the extensor tendons has already been performed

OBSERVATIONS ON TENDON TRANSPLANTATION OPERATIONS

BY HERBERT P H GALLOWAY, M. D., WINNIEG Orthologic Surgery, Manifola Medical College Orthologic Surgery, Manifola Medical College

TIME exceedingly wide-pread prevalence of acute auterior poliomyelitis in Western Canada, in common with almost all parts of the North American continent, during the past three or four years, has afforded exceptional opportunities for studying every feature of this disease afresh. The amount of human wreckage cast upon the shores of orthopædie surgers by this storm of paralyzing disease has been surprisingly large, and in consequence the writer has had an opportunity never before afforded him in such generous measure of studying and comparing the results of various surgical procedures for the relief of paralytic deformities in a sufficiently large number of cases to justify the formation of an independent judgment and the expression of a personal opinion in regard to their relative merits

In the present paper it is the writer's purpose merely to record some of the conclusions arrived at from his personal experience with various appliestions of the operation of tendon transplantation in the treatment of paralytic deformtites, particularly those due to pulsions edits and spastic paralyses, and to deserble and illustrate

the techniqué folloxed in performing them There is sometlung so pecuharly audiscous and seductive about the proposal to deliberately transfer from one point to another the motor power of muscular contraction, even to the extent of completely reversing the normal action of the muscles, that once it had been demonstrated that this could be successfully accomplished, it that the rould be successfully accomplished, it the really useful operations desired, many function of the principle of tendon transplantation were proposed and trited, only to be abandoned later

While in unusual cases exceptional procedures may with advantage be devised and carried out, there are not, in the writer's opinion, more than six or eight tendon transplantations in the lower extremity and two or three in the upper extremity that can be regularly employed with benefit

One of the commonest deformaties resulting from poliomychits is a more or less excre valgoid position of the foot. When, as frequently happens, this is due to paralysis of the tibialisanterior or the tibialis posterior, one or both, the other muscles governing the foot remaining

active, immense benefit may result from transplanting the peroneal tendons so as to give them an insertiun to the or calcir just anterior to the inner border of the tendo achillis, and at the same time transferring the action of the extensor proprius pollicis from the great toe to the neck of the first metatarsal. When in addition to maralysis of the tibiales the gastroenemius is also paralyzed, leading to calcaneus deformity, the operation of transferring the peronei to the os exicis is even more strongly indicated, as the peronei are capable of sufficient development to counteract to a considerable degree the dropping uf the heel In a few instance, instead of transplanting the perones it is better to transplant the outer half of the tendo achilles to the inner side of the excalcis. The technique now employed was gradually improved in certain details as experience increased, and has now been used for several years with but little further modification Before describing any of the operations in detail

a few general principles may be stated:

1 Perfect across is indepensable for success
2 Attachment of the transplanted tendon to
the bone or periosteum is always more satisfactory than attaching it to another tendon or
other soft issues.

3 The tendon must be stretched moderately tight before being secured

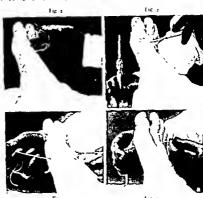
4 It must be fastened with suture material
that will maintain its hold for several weeks.
5 A covering of subcutaneous tissue should

5 A covering of subcutaneous tissue should be brought over it before the skin is satured.
6. Ample time (about six weeks) should elapse before the transplanted tendon is allowed to functionate, so that its new attachment may become sufficiently strong, further, the nucele

should be systematically developed by massage and exercises and carefully protected by mechancal means from overstrain for several months after the patient begins to use it.

TRANSPLANTATION OF FAITAGE PROPRIES POLLICIS TO AFCK OF FIRST METATARSAL Group A Incusion about an inch and a half in length

extending backward from models of great toe along oner dorsolateral aspect of foot. Tendon exposed and severel at anterior extremity of incision and dissocied backward, including its shouth. Over the neck of the metatrial the incision is deepened, going down through the soft insistes and periodicum. The periodicum is then kraped



GROUP A Transplantation of extenser proprint pullets to neck of first metatarsal hone lig 1 - Extensor propries pollicis tendon detached and suture secured to it lig 2 shows metatar-al being dulled and instruments for enlarging drill hole lig 3- femion being drawn into hole in metatareal by forcing suture through bone and out through sole Fig 4-Suture te-en terrel, passed around side of bone and made to emerge through original wound

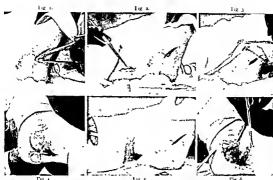
aside slightly so as to expose neck of metatarsal which is then completely perforated with a fine hone drill the hole being then enlarged and a funnel shaped entrance to it provided with the instruments illustrated estimated the length of tenion necessary to give the right degree of rension. No 2 chromic cargul is secured to the tendon and the needle is passed straight through the hole in the metatarsal and made to perforate the sole of the foot re-entered about 48 inch from its point of exit and carried around the outer side of the neck of the merararal until it emerges in the original wound. If a straight needle has been used to perforate the sole at should be changed to a half-curved needle before re-entering ir. To avoid any chance of infection from the skin a short incluion in the sole between the points of emergence and re-entrance enables the cargur to be completely buried. Having been drawn tight so as to make the extremits of the tendon enter well into the metatarnal, the cargut is made to traverse the rendon and surrounding soft tissues once or twice before being tied. Then the transplanted tendon is covered by drawing over it the subcutaneous lissue with a continuous suture of plain catgut and the skin sutured with silkworm gut

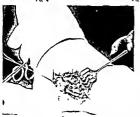
While the description may seem to indicate a rather complexately procedure, the operation can easily be performed in fifteen minutes. The result of this operation is to translet the activate propriits policies from the movable to to the relatively freed mentatareal, and the muscle becomes a fairly powerful dorsal flevor as well as tending to incurr the foot.

I have a number of times, in addition to transplanting the extensor propries pollicis, attached the tendons of the common extensor to the four outer metatar-als, using practically the same technique as that employed with the extensor propries pollicis. This operation is particularly suited to those cases of pes cavus with slight equinus in which the toes are slightly dislocated upon the dorest aspect of the heads of the metatareals when the common extensor contracts. A preliminary operation to flatten the sole by subcutaneous division of the plantar Jascia and arenching are nearly always necessary in this class of cases two or three neeks before the transplantation is attempted, and the tendo achillis must usually be lengthened just before the transplantation of the extensor tendon is commenced

TRANSPIANTATION OF PERONEL TO UNITE SIDE OF OS CALCIS

Group B By a slightly curved incision about an inch and quarter in feetile, extending downward and forward from a point slightly anterior to the perional tubercle, the perional tendons are exposed and cut off as far forward as the base of the fifth metatrisal. One or both kindion may be taken, as previously determined by the extent of the deformity, in most caves I choose both. A second short





vertical incision is their mish, behind the final, a short distance above the malfelolis and a blant dissect and stating closed artery forceps has my been worked betteath the tendons they are then forcefully driven through the opening. A third incision along the meet safe of the tendo of the concept of th

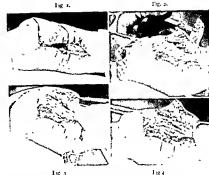
Gasot F. Terreplantation of persons to more indeocaskis. Is g. "relevantly include ne-sporal and distantlig z—instrument passed benetils into a facilitation of the instrument passed benetils into the instrument passed benetils into the instrument passed benetils into the instrument passed benetils in the instrument in the instrume

hafte or a time chised a strong bridge consisting of a thin layer of bone covered with personseron and some of the subscattaneous treese is rused from the inner side of the best, beneath which the personal tendous are drawn and strongly satured with chrome cargot, the wounds are then closed in the sound way, calgul being used for the first control of the control of the control of the layer of the control of the control of the control of the loot is brid in the sourcival protein by planter of parts band quest applied over the usual dressings.

I frequently perform this transplantation and that of transplanting the extensor propring policis to the neck of the metatarsal at one operation; and in the severest cases of paralytic valgus, an arthrodess of the astragalo-caphoid articulation is done at the same time.

TRANSPLANTATION OF THE OUTER HALF OF THE
TENDO ACHILLIS TO INNER ASPECT OF HEEL

Group C In certain cases instead of transplanting the perone it is a most useful procedure to split the lower two



Group C Transplantation of outer half of tenilo achillis to igner aspect of heel lig 1-Wound to expose tendo achillis and the region to which its outer half will be translerred Fig 2-Tendon split anteroposterovily and outer half detached from os calcis Fig 3 - Outer portion passed through tunnel created anterior to inner portion, and about to he grasped by for cens passed beneath perioster) bridge raised from os calcus Fig 4 - Transplanted portion drawn beneath bradge and sutured

or three inches of the tundo achilla by a vertical antenposition incheon, distaching the outer boll with a time layer of the underlying bone, and then, after drawing the distached portion through a tunnel transfed antimore to the inner half of the tendon, attaching it to the inner side of the held in a similar manner to time you described in connection with the transplantation of the perioneal tendons.

The cases demanding this operation are enchy those in which the tendo achillis is slightly shortened so that the foot cannot be dorsally sheed to the normal event. Under such active metanes, it is often plainly apparent that the tendon is an active everter as well as a plantar facor, as a preliminary step it is usually necessary to lengthen the tendon by a tendomy performed by Beyer's method or through open incision, the transplantation being done about three week's later.

In another class of cases the action of the tendo achillis tends to invert the foot, and in these it will often be found most useful to reverse the operation just described, transplanting the inner half of the tendon to the outer side of the heef

TRANSPLANTATION OF TIBIALIS ANTERIOR TO OUTER SIDE OF TARSUS

Group D. In a few instances of paralytic varus the tibialis anterior may with advantage be transplanted to the outer side of the tarsus or to the base of the fifth metatarsal, secore attachment being obtained by drilling the bone and drawing the tendon through it. It is essential

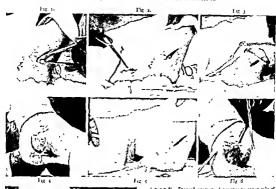
to data h the tendon as far formard as its insertion extends, because it is rather difficult to secure sufficient liength, and it must be dissected free to a point well above the analysis of the many size of the transplanted tendon will not be sufficiently direct to allow it in act to the best mechanical dawnings. Occasionally, no correct salges, it has a transplanted the common extension to the sufficient of the sufficien

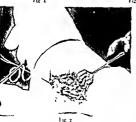
Another exceptional operation, very useful in certain cases of calcaneovalgus deformity is transplantation of the tibials posterior so as to attach it to the os cales just anterior to inner border of the tendo achilis.

These are practically all of the tendon transplantation operations in connection with the foot which have survived the test of my personal experience.

TRASSPLANTATION OF BICLPS OR SUMI-MUMBRANOSUS TO PATLLLA

Group B: Complete paralysis of the quadriceps is one of the most common results of a severe attack of infantile paralysis. This is a serious disability, rendering the patient very inscure through being totally deprived of the power to actively extend the leg upon the thigh. It may happen that the hamstrings are also paralyzed, in which case the patient must content himself





sectual motion is then much leibred the fibral; a shore distance above the mileculus and a blant disory tor or a strong closed artry forceps bytong been worked between the tradours her are then front by drawn strongly the opening. A third necessar along the more stade of the tender of the contract of the strong stade of the tender along the stade of the stade of the stade of the contract along the mide to permit caposate of the brick part of the miner surface of the so cacles. Which should artry forceps a free translet actions to the bright which we have a long that the stade of the free translet actions to the stade of the head. It with a long togget and draw to the many side of the head. isoto P. B. Transplantation of premot to more the of or clear. By a "Cleanest tendine exposal and distable by a "Indiamonal prison" long the product of the clean during middless, by a "Pendona tiesa in Indiamonal Company and the clean and t

hash or a me third a strong bridge consisting of a bits last of lone covered with per notean and some of the substitutions treuse as caused from the inner side of the substitutions as treused as the substitution of the substitution as the substitution of the substitution as the substitution as the substitution of the substitution as the substit

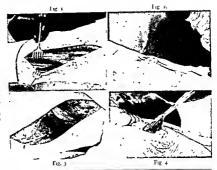
I frequently perform this transplantation and that of transplanting the extensor proprus policis to the neck of the metatarsal at one operation, and in the severest cases of paralytic valgus, an arthroisess of the astrogalo-scaphoid articulation is done at the same time.

TRANSPLANTATION OF THE GUTER HALF OF THE

TENDO ACHILLIS TO INNER ASPECT OF HEEL.

Group C. In certain cases instead of transplanting the perione it is a most useful procedure to split the lower two

GROUP E Transplantation of bicens to patella lig 1-Exposure of lower part of biceps and external popliteal nerve Fig 2-Patella exposed and strong periosteal bridge raised from its anterior surface Also shows biceps detached and held up by suture I'ig 3-Biceps winding around from posterior to anterior aspect of limb Fig 4-Extremity of biceps drawn beneath bridge raised from front of patella Fig s-Extremity of biceps surgred to its new insertion on front of patella



there are only two which can be regularly performed with confident expectation of benefit, and the conditions requiring these are found in ordinary hemiplegia and in congenital spastic paralysis rather than in polomyelius

These two operations are (1) conversion of pronator radii teres into a supinator, and (2) conversion of the flevor carpi radialis and the flexor carpi ulnaris into extensors of the wrist

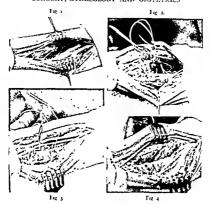
We are all only too familiar with the crippled position of the hand which so often results from hemiplegia, the wrist being acutely flexed, the hand fully pronated and the fingers almost or quite incapable of voluntary extension the deformity be severe the unfortunate pa tient is often very grateful for the improved appearance produced by the operation, which overcomes the extreme flexion and pronation. even though the fingers remain largely useless, while in the milder grades, where considerable voluntary power of extension of the fingers remains or can be developed, correction of the flexed and pronated position of the hand will often make the difference between a practically useless member and one that can be trained to perform many useful services

TRANSPLANTATION OF PRONATOR RADII TERES TO CONVERT IT INTO A SUPINATOR

Group F The technique followed in this operation is practically that described by Mr Robert Jones and Mr A H, Tubby



Incuson about 4 teches in length following the count of the radius atterty and extending from near the bend of the clobus to well below the middle of the forearm, the radial artery and nerve are soluted and carefully held sode, the possition is easily recognized by the diagonal sode, the possition is easily recognized by the diagonal sode, the possition is easily recognized by the diagonal considerably in different subjects, being sometimes high considerably in different subjects, being sometimes they and sometimes equate low. It is torough that considerably in different subjects, being sometimes the first considerably in different subjects, being sometimes the first considerably in different subjects, being sometimes the first considerable in the considerable of the radius as in offerent to the radius as in offerent to the radius as the considerable. A radius by positionizing the membrane with the first three radius are carefully and can in close contact with the radius worked up and down in close contact with the radius



GROUP | Cinystrom in province radii tere into a signimor | Ig t—Promator radii tere caposed and aeric atal vessel adram a blied | Ig a —Promo of promator featured from on a section and about to the draw introduction space by nature serving to it. Ig 1 — Somming extremely a fermator entering at controlled and after being draw anterspecteority through failus | Ig 4 — I streams, of promator features are consistent with a feature serving and are represented by the result of the controlled anterspecteority through failus | Ig 4 — I streams, of promator failure security of the controlled anterspecteority through failus | Ig 4 — I streams, of promator failure security of the controlled anterspecteority through failus | Ig 4 — I streams, of promator failure security of the controlled and the controlled an

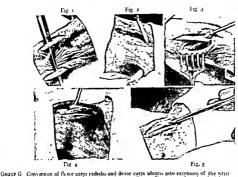
Great care must be extracted not to injure the instruso-conners. Next a shallow depression 5, such and is recentwith both emblding foregos in the outer works of its beautiful to the control of the control of the six to be made. By mean of a string double lighters of chromic catgot attached to at send the tendon is then drawn through the gap in the intersoveral membrane and made strand of the double lighter being their arrived through a transition of the double lighter being their arrived through the reads an acceptance of the control of the needle transfuring the tendon as it has believed the raises founding the tendon as it has been the read of the founding the tendon as it has been the read of the control of the cont

I have performed this operation quite a number of times and have found it vecedingly useful After it has been done, the lessened resistance to supnation is quite apparent. I confess, however, that I have never been able to fully satisfying self to what event the improvement is due to the muscle becoming an active significant suspect that the improved condition of the arm results quite as much from the muscle being completely shown of its power to act as a promator.

This doubt arises from the fact that the method of anchoring the end of the tendon's much less satisfactory than where the tendon's much saved under a strong bridge of persolvem. This latter method is impracticable in connection with this particular operation, because the tendon cannot be satisfactorily detached from its insertion and at the same time left sufficiently long, without removing with it a considerable portion of persolvem from the outer side of the radius just at the point where the bridge is required.

CONVERSION OF FIENDR CARPI RADIALIS AND FLENOR CARPI LENARIS INTO FAILNORS OF THE WRIST

Group 6 This operation is nearly always performed at the same time as the transphiration of the pronator radio teres or as a secondary operation two of three weeks afterwards. Burelly the foottoms of the fibrors afterwards the supposed through short necessors directly over them on the front of the footarm. Using all care so as not to sound the surrounding vassels and nerves, the tendons are de-



Group G. Conversion of fluor carps radials and fluor carps whats into extensors of the wrist. Fig. 1—Tendons of fluor carps radials and ultimate exposed in front of since Fig. 1—Showing tendors cleached from unvertion. Fig. 2—Flexor carps ultimate strain to back of since and made to perforate extensor carps ultimate. Fig. 4—Flexor carps radials drawn to back of since and made to perforate tendon of extensor carps radials longor. Fig. 3—It has suturing of flevor carps radials longor.

tached close to their insertions with a stout bone kmfe kept close to the bone, the detached tendons are then cleared for a couple of inches above the wrist. After exposing the lower part of the extensor carps ulnaria through an incision behind the lower part of the ulaa, a tunnel is created beneath the skin, the end of the flexor tendon deawn through and securely statched as low as possible to the tendon of the extensor Similarly the flexor carpi radialis is carried to the back of the wrist and attached to the tendon of the extensor carps radiales longtor Attaching tendon to tendon is never as satisfactory as attaching ten don to bong, but in this operation no other method is available. In order to make the anchorage as secure as possible, the extensor should be perforated and the flexor drawn through it before being stitched as shown in the diagrams By repeating the same technique on the radial side of the arm, the radial flexor can be securely attached to the extensor carps radialis longior. Liven if it were granted that no positive action of the transplanted flevors could reasonably be expected, the advantage of deprising them completely of these power to flex the wrist will hardly be disputed by anyone who has examined one of these patients before and after the operation, but I am consinced that the transplanted muscles do exert a positive extend ing action, provided the operation has been properly done so as to securely anchor the transplanted tendons to their new insertion. Attempts have been made to attach a por tion of the trapezius to the paralyzed deltoid with the hope of restoring some degree of power to the latter I have had limited experience with this operation, but regard it as useless

Much has been said and written about Lange's method of elongating tendons and making artificial Igaments by means of silk. In connection with all ordinary tendon transplantation elongation with silk, is quite unnecessary if care be taken to secure all the length possible by detaching the tendon directly from its unsertion. The unnecessary introduction of a foreign body like silk is to be deprecated, but in replacing a partly destroyed tendon, as for example a destroyed ligamentum patellar, Lange's method of using silk so as to form a lind of framework, about which nature can construct a new tendon will be found of numeries service. It has also a limited application in the creation of artificial ligaments about flast joints.

In the foot, arthrodess may sometimes be combined with tendor transplantation with the greatest advantage, thus, in very severe values, if the astragaloscaphoid joint be very lay, arthrodess of this joint may sometimes be combined with transplantation of the perione and extensor propriats politics, while in severe varus a wedge from the outer side of the tarsus may be required in conjunction with transplantation of the lineer half of the tendo achillis to the outer side of the field, or of the tibulist anticus to the outer side of the heat, or of the tibulist anticus to the outer side of the heat, or of the tibulist anticus to the outer side of the heat, or of the tibulist anticus to the outer side of the new transplantation of the same transplanta

son of the exact indications for these combined operations nor of the technique used in performing them

The thirty-logr original illustrations accom-

The thirty-four original illustrations accompanying this article are reproduced from photographs of the various operations performed on the cadaster. My warmest thanks are due to Professor Evatt of the Anatomical Department of

Manitoba Medical College for placing the newstry anatomical material at my deposal and his kindly and interested co-operation in various ways; also to his assistant, Mr. C. B. Lewis, whose skill in photography was most helpful 1: whose skill in photography was most helpful 1: am also greatly indebted to Dr. S. Alwayn Smith for valuable assistance in getting the various dissections, ready to be photographed

THE TECHNIQUE OF TUBAL STERILIZATION

By IRLD J TAUSSIC, M D, St Louis
Geographical lathe St Louis Cat Sandarium

THL rather frequent occurrence of pregnancs among insane women who, either because of improvement in their mental condition or at the request of relative, have been dicharged from the anitarium, bring up the quetion of sterilizing such wanten before permitting their departure. Such measures seem doubly advisable, on the one hand because of the frequent detrimental influence of pregnancy upon the psychosis, and on the other hand because of the almost invariable herculitary transmission of the psychosis to the progeny. When we consider the predominant rôle played by heredity in the causation of insanity, steps taken toward dinimishing the number of children born of insane mothers certainly seem justifiable. While the human race is harely awakening to its responsibility in the problems of eugenies, and the laws of this country do not as yet generally recognize the right to perform sterilization operations per se, nevertheless, il done in association with other operative work, there can be no objection

In my service at the City Sanitarium, while operating for mosable retroversion, ovarian cyst, one-sided inflammatory trouble, and other gag-cologic allments, I have had occasion a number of times, always with the consent of the patient's relatives and upon consultation with the superintendent, Dr. George A. Johns, to include the operation of tubul sterilization. From the unfavorable reports of other surgeons and from personal experience, a somewhat modified technique has been evolved and employed in the lard could be continued to what of different methods except by a priori reasoning and occasional failures.

Simple ligation of the tubes with excision of a small piece has not been uniformly successful,

probably owing to the patency of the uterine end of the tube after the ligature of the tube had cut through. Similarly the excision of the interstitual portion of the tube at the uterine horn resulted in one of Kuestner's cases in pregnancy following the operation through the formation of a utero-alsdominal opening Asch and Labhardt employ a technique by which the cut end of the uterine portion of the tube is slipped within the folds of the broad ligament. The objections to this technique as I see it are the possibility of a small rent in the perstoneum of the broad ligament, allowing of possible impregnation, and the danger of the development of a hydro-alpine in the sealed portion of the tube. It is this same likelihood of a hydro-alpine that is in my mind so strong an objection to those methods of sterilization in which the fimbriated ends of the



Fig. 5. The interstitual and isthmian portions of the tube have been removed. The ligature in the uterate horn has not yet been lied



Fig. 2. The ligated and of the remaining position of the tube has been drawn down between the lolds of the broad ligament and fastened there by a suture through the anterior sheath of the ligament

tubes are either sewed into a fold of the broad ligament or drawn upward through the inguinal canal and there tied off. It therefore seemed wise to somewhat modify the technique heretofore employed.

The technique of my operation is as follows The abdomen is opened by a small median incision in the usual manner and the uterine end of one Fallopian tube seized with forceps. The uterus is thus pulled into view so that a suture can be passed through the uterine horn at the tubal insertion. Before tying this suture, the interstitial portion of the tube is cut away by a V-shaped incision Next, the tube is freed from its peritoneal attachment for a distance of about one inch and, a ligature having been thrown around the distal end, this free portion of the tube is resected. Figure 1 shows conditions at this point in the operation. It will be seen that the needle is left threaded in the ligature thrown around the tube.

With an artery forceps or Mayo dissecting scisors the layers of the broad ligament are separated from each other at the point where it has been opened up. Catching the end of the tube with an extra suture to prevent it from slipping, the threaded needle is now passed through the open space in the broad ligament, and emerges just antenor to the round ligament near the attachment of the vesical pertineum to the uterus. An extra suture is passed through the periloneum at this point so as to completely bury this end of the Fallopian tube in the broad ligament (Fig. 2).

The third step in the operation (Fig. 3) con-



Fig. 3. The round ligament is sutured over the cut in the uterine horn, covering this and the opening in the broad ligament at the same time

sists of sewing the round ligament by one or more sutures to the upper posterior surface of the uterus, thus closing over the point of the tubal insertion and the small open space in the peritoneum of the broad ligament

The same technique is observed in resecting the tube of the other side, and the abdomen closed in the usual manner

In cases of movable retroversion the round ligaments can be folded back far enough to meet in the median line on the posterior surface of the uterus and hold that organ forward and upward

The advantages of this technique are its greater security against possible conception. The steps are so simple and easy as to require but a few minutes, and the addutional precautions would seem to be worth while.

To specify the advantages of the technique

employed, we have:

(1) Resection of the parrowest part of the tub

(1) Resection of the narrowest part of the tube (the interstitial portion)

(2) Closure of the uterine wound by a double layer, first of the uterine wall, second of the round ligament
(3) Burying of the proximal end of the cut tube

far away from the uterine horn

(4) Presention of hydro-alpiny by leaving the

fimbriated end of the remaining portion of the tube open

The operation just described can be done

vagually as well as abdominally, but, except for patients with prolapse or relaxed pelvic floor, the abdominal route is preferred on account of its simpler technique.

IMMEDIATE CLOSURE IN PERINEAL PROSTATECTOMY

BY ARTHUR E HERTZLER, M. D., KANSAS CITY, MISSOLRI

If has always seemed to me that to pack a fresh wound in order to control bemorrhage and secure drainage, as is done in the accepted operations for the removal of the prostate, is out of keeping with modern surgery. In order to meet this very obvious objection I published an article some time ago, i describing an operation from which this defect is eliminated. The operation as proposed is ideal, but is limated by several factors. It is not suitable when there are stones in the bladder or when there are stones in the bladder or when there have a pediuculated lobe extending into the bladder. The chief objection, however, is that it appears more difficult than it really is

To meet the indications of modern surgery and at the same time remove these limitations in my first operation, I have modified it so that it is applicable to all cases except radical excision for malignancy, and stone or pedunculated lobe or timidity need not be a bar to its performance

The method vares from Young's classic operation in two particulars. (a) the harmorrhage is controlled by ligature and the cavity occupied by the prostate is obliterated by suiture, (b) the opening made into the urethra is sutured hermetically about a drainage tube. This keeps the unifie from the wound and permits it to be conducted to a receptacle beside the bed, as in drainage of the rail-bladder.

In detail the following points may be emphasized. The patient must be properly placed on the table. Young's suggestion of elevating the hips of the patient is not fully appreciated by many operators. This simple modification in position makes it possible to view all parts of the field of operation.

The incision and instruments suggested by Young are ideal. A free mission of the soft parts is necessary in order to obtain the greatest possible exposure of the region. The urcharance behind the bulb should be visible. The lower and posterior surfaces of the prostate should be freed, and all harmorrhage should be controlled by grasping the bleeding points with forceps and ligatures applied just as would be done in any operation.

With the field of operation thus exposed in Young's manner, I suggest the following procedure:

The urethra is opened back of the bulb by an Sung Gynec & Obst Dec 1920 p 602

incision 2 cm long The bladder is explored, and if stones are present they are dealt with. The form and size of accessory lobes are noted. A Young's tractor is now passed, and the prostate brought as deeply into the wound as is consistent with perfect safety to the soft parts The cansule of the prostate is then incised and the separation of the lobes is begun The finger, scissors and kmfe each has its place, and since the wide incision permits a knowledge of the size and form of the prostate as well as of the nature of the tissues, the lobe can be excised with precision Whenever, during this procedure, a vessel of any magnitude is severed, it is clamped and ligated No more time is required to ligate at this time than later, and the clamp is out of the way and is available for use again When one side is removed the space is evplored for any actively bleeding points, which are caught up and ligated There will still be considerable oozing from the surfaces. The cavity is now temporarily packed with a strip of plain gauze

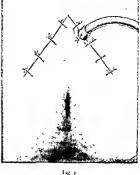
The other side is now excised in the same way. The predunciated lobe is now removed by pushing it into the site of one of the lateral lober This is most conveniently done by removing the packing from the side first operated upon and upshing the lobe into this cavity. If the peticle is narrow and the lobe small it may be removed through the urethra

When the enucleation is completed the packs are removed from the cavities previously occupied by the lateral lobes and the obliteration of the cavities commenced. This is done with a No 2 catgut mounted on a medium size fullcurved round needle The sides of the cavities are brought together (Fig 1), thus obliterating the space and checking any tendency to cozing that may still be present. The amount of tissue available for this closure will depend on the skill with which the previous steps of the operation have been performed Theoretically, the capsule of the gland should be available, but in practice it is often bladder, rectal wall, or levator fascia, or even tissue for which the operator is not ready with a name that would be recognized by the B N A Be this as it may, there is a cavity with walls and this cavity can be obliterated by bringing these walls together by successive sutures,

either continuous or interrupted

Fither after or before the obliteration of the
cavities the drainage tube is passed through the





incision into the urethra to just within the blad-The incision into the urethra is now closed snugly about the tube so that the urine cannot escape (Fig 1) The tube should be fastened to the skin by means of a suture in order to prevent it from slipping too far within or without the bladder The collar about the tube, as shown in Fig 2, is secured by drawing a slightly larger tube over the one used for dramage permits anchoring the tuhe without perforating its lumen I am indebted to my colleague Dr Harrelson for this suggestion

After the tube has been securely sutured into the urethral opening the incision into the superficial soft parts is closed by deep sukworm gut sutures (Fig 2) No drain other than the tubular drain into the bladder is used A dry pad is used over the wound, perforated to permit the passage of the drainage tube

After the patient is returned to his bed, a longer tube is attached by means of a short glass tube, and the urine conducted to a receptable at the side of the bed

If any clots form in the bladder from bæmorrhage due to intravesical manipulation, such as stone extraction or removal of a pedunculated polyp, they can be removed by disconnecting the dramage tube at its junction with the glass tube and the clot aspirated by means of a Janet or similar syringe Irrigation may be done through this tube if it seems desirable

The length of time the draininge tube should remain in place is a matter of conjecture. It should remain theoretically long enough for the wound to have healed sufficiently so that the contact of the urine after the removal of the tube will not affect the line of incision Tissue is not available for studying the rate of healing in the human subject. It can only be stated that in lower animals the change from fibrin to fibrous tasue begins at three or four days and is well advanced in six or seven. For the want of more definite information I have allowed the tube to remain in from four or five to even six days The neck of the bladder ordinarily tolerates the tube if it has been well placed, and by this time the wound will no longer break down when the urme flows over the permeum

If the removal of the prostate and the closure of the cavity have been done with precision, instead of bringing the drainage tube out of the perineal wound a large catheter may be passed down the urethra into the bladder, and the wound closed about it. As large a catheter as the penile urethra will admit should be used The opening into the urethra and the soft parts are then closed

without drainage. The operator should not become tunid at this point and pass a gause drain down to the incision into the urethra, for this will most certainly cause failure of union. The catheter is allowed to remain in position from seven to ten days. I have used immediate closure in external urethrotomy with success for a number of years, and it seems to work, as well where the removal of the prostate is, added. I have not attempted the catheter method unless the unne was relatively free from infection.

The advantage of this method of operatine has been the definite abandonment of all pause passes and drains in the perineal wound. Less blood is lost because the large vessels are caught up of the definition of the large vessels are caught up definitely hasted at once. The bod has been kept clean and the patient dry for four or five days during his severest illness, when the drain is through the nenneum, or permanently when

catheter is used. There is far less abscess forma tion about the stitches and in the superficial parts, and fat necrosis is less likely. The final closure of the perineal incision is hastened and complete closure is much more certain. The objection that may be raised against the operation is the longer time required for the operation. Forty-five minutes will be required for the average operator. An especially skillful operator should reduce this time. The possibility of infection may be raised If infection occurs the superficial sutures may be removed. I have never had more than a portion of the external wound break down, nor has there been serious infection threatening the life of the patient. The operator should be able to judge his patient. The healing power of the patient and the state of the urine furnish an index, though I have used this method with success in old men with urine by no means sterile

A TUBERCULOUS CYST, PROBABLY OF PANCREATIC ORIGIN

By J. M. MASON, M. D., BIRMINGHAM, ALARAMA Garcologia to St. Americand Hilliago Hospitals

A\D

E M MISON, M D. BIRMINGHAM, MARANA

Physician to Out pagent Department of Luncont Hospital, and Pathologist to Hillman Hospital

V JIILL the pancreas is singularly immune thereuses, insularly tubercles are sometimes found in association with tuberculosis of other parts of the body. Kud-res/sly found military tubercles of the gland in twelve of one bundred and trenty-eight cadadies with tubercles of other organs, 44 44 per centile being in children. The pancreas was secondary involved in iss out of eighteen cases of acute military tuberclusis (1).

Hale White's series of one hundred and fortytwo autopsies showed less than one per cent of involvement of the organ in all cases of tuberculosis (2)

The disease frequently begins in lymphatic glands in contact with the pancreas or even within the substance of the gland (2)

Primary tuberculosis of the pancras is exceedingly rare Opie (1) cites the cases of Aran, Chrostek, and Mayo as examples of primary tuberculosis, while Robson and Cammidge only mention the case of Mayo (3)

Adami, Opie, and Robson all refer to the case

of Sendler, whose patient, a woman, presented a small tumor above the unbilicus, and suffered with pain and vomiting. At operation the tumor was found in the head of the paneraand upon removal it proved to be a tuberculoulymphatic legand. It is possible that some disorder cases mentioned may have been of this nature.

A careful search through the literature does not show any record of tuberculous cyst of the pattereas, hence the following case will perhaps be of more interest from a pathological than a surgical standpoint

History P. C., colored female aged 27, entered the Gynecological service at 54. Vincent Hospital, on June 9, 1911. She was referred by Dr. J. B. Cooper. A tumor distincted the abdomen to the size of a full term pregnancy. She gave the following history.

Mother and a real, fasher deed from accident, other mothers and the fashing a brother, who is also and sed. There is no family bistory of tuberculous and set has not been exposed directly to the disease as far as the knows. She was married at the age of 15, and has had free chaldren and two miscarriage.

Eight or ten years ago she noticed a tumor the size of

an egg in the middle line some distance above the umbilicus. It occasioned no inconvenience, but she noticed that it slowly increased in size, and finally began to cause an occasional sensation of nausea and giddiness. She had no colors or jaundice and continued in good general health, giving birth to several healthy children. During the past three or four years the growth has been more rapid, particularly in recent months, and her last two pregnancies

have resulted in miscarriages or abortions. Examination Examination revealed a large fluctuating tumor hulging prominently in the epigastrum and extending downward in the abdominal cavity, particularly on the left side, reaching as low as Poupart's ligament and extending well into the left loin. This region was dull on percussion, while the right side showed a good deal of tympany. The uterus was normal in size and position, there was no apparent connection between the tumor and either tuhe or ovary, and the cyst

did not extend into the pelvis-The lungs and heart were normal, as was also the urine. The temperature was 1003, the pulse 102 and the leucocyte count 8,500 Further physical examination was

A probable diagnosis of pancreatic cyst was made, though before exploration other conditions could not be

entirely excluded

Operation. An incusion was made through the left rectus. The cyst was firmly adherent to the anterior abdominal wall above the umbilicus, but was free below and on its under aspect. It was aspirated and three and one half litres of nurulent material were drawn off. Probably half a fitre more was sponged out and escaped. The walls were covered with thick cheesy material which could not be entirely removed. The uterus tubes and ovaries were found to be entirely normal and unconnected with the The atomach and colon were displaced into the pelvic cavity, the colon being helind the symphysis and the stomach, occupying even a lower position in the pelvis. The tumor had evidently gone forward between the liver and stomach, pushing the gastrohepatic omentum in front of it and gradually crowding the stomach farther and farther downward. The gastrohepatic omentum was very much thickened and could be seen going from the stomach to the surface of the cyst The left half of the abdominal cavity was filled by the

cyst, but the right side was not so much encroached upan. the small intestines being crowded over into this side The hand could be passed behind the sac well up toward

the diaphragm, where its attachment ran in a transverse direction across the upper abdomen. Both kidneys were in position and had no apparent connection with the cyst In front and on the antenor aspect of the sides the cyst could not be traced owing to the dense adhesions peritoneum, except for the anterior adhesions, was perfectly

Enucleation was considered, but we found it impossible to remove the sac from the anterior abdominal wall, every effort resulting in tearing into the sac. A large part of the cyst wall was, therefore, drawn up from below and excised after which the remainder was attached to the abdominal incision and the cyst cavity packed. A drain was passed into the peritoneal cavity.

The patient made an uninterrupted recovery, and at the tune of our last examination, two weeks ago, the cavity had filled with the exception of a small sinus less than two inches deep and hardly half an inch in diameter

Unfortunately the fluid from the cyst was thrown out before the operation was finished, and no observations on its chemical constituents could be made. However, Nothnagle discounts the value of these examinations from

a diagnostic standpoint (4). A small quantity on culture medium remained free from growth Microscopic examination of the excised cyst wall made

by Dr. E. M. Mason showed the following conditions:

Section of cyst wall Diagnosis Tuberculosis "Thickened fibrous tissue with few scattered tubercles

containing grant cells; isolated accumulations of round cells-probably early stage of abscess formation" "Sections were stained for tubercle bacilli but with

negative result." This examination confirmed the diagnosis made from

the clinical appearance of the cyst wall and contents.

These findings were of such interest to us that we sent the material, together with the case report, to Professor E. L Opie, who kindly made the following report on his examination

"Section marked 185 Cyst wall Pancreas. The section on one side, consists of dense fibrous tissue, much of which has undergone hyaline degeneration. This tissue is the site of acute inflammation and contains numerous polynuclear leucocytes. On the other side of the section, the tissue is much more cellular and there is no hyaline degeneration, here lymphoid and plasma cells are numerous, together with a moderate number of polynuclear leucocytes As the surface is approached, similar cells occur closely packed together, here and there are grant cells with nuclei arranged about the perphery, in the immediate neighborhood, cells of epitheloid type are numerous. No typically formed tubercles occur."
"Second section resembles closely the first. The tissue,

in great part, is dense, fibrous and in places hyaline; cellular areas occur and here an occasional grant cell of the type previously described la found. In places cosin ataina very sharply defined collections of 'fuchsin bodies.'

Remarks. "The appearance is that of a chronic tuber-culous process and I feel little doubt that the lesion is tuberculous In the sections examined, there are no typically formed tubercles and no foci of caseation. There is, moreover, evidence of acute inflammation. The sections examined contain no pancreatic tissue"

In establishing our diagnosis, we must consider cysts of the liver, the gall-bladder, the spleen, the mesentery, the kidneys and the adrenals.

The kidneys and mesentery may be at once disposed of, as these were either under plain sight or touch and had no connection with the cyst,

The gall-bladder may be eliminated, as a cyst of this viscus would have developed along the right rather than the left side of the abdomen, in a manner exactly opposite to that found in the present case.

It is inconceivable that a splenic tumor would have first appeared as a small round tumor in the middle line, for the organ would have enlarged greatly downward and forward before it would reach the middle line at all.

The classical paper of McCosh on Suprarenal Cysts (5) gives the principal differential points between suprarenal and other deeply seated retroperitoneal cysts. He gives the following differential points: Onset is usually slow, with pain in the hypochondrium of the affected side. Sometimes the onset is sudden, owing to the occurrence of hæmorrhage into the cvst: bulging under the free border of the ribs; urine may or may not be abnormal: kidney is usually displaced downward; the pancreas forward and downward; the liver upward, forward and toward the middle line; the colon in front, and the kidney generally adherent. The cyst is more fixed to the tissues of the back than is the case with cost of the pancreas. In his own case, and in six cases cited by him, the tumor was located in the hypochondrium or loin.

A suprarenal cyst whose sac showed "chronic diffuse inflammation probably tuberculous in origin" is reported by Jonas. While this cyst did not in any way resemble mine in its location and attachments, its contents and the wall of the cyst did resemble it closely. However, in his case the course of the disease was very acute, almost exhausting the patient within a month, at the end of which time it was successfully removed (6).

Liver cysts may be divided into parasitic cysts, retention or bile cysts, simple cysts, congenital in origin and usually due to malformations and multiple cystic disease. In the present case, all these may be dismissed except the simple congenital cysts Nothnagle reviews this subject at some length (4). Usually the cysts are discovered at hirth and frequently obstruct delivery. as in eases reported by Witzel, Sanger, and Kloppy. Many small cysts the size of walnuts have been found about the region of the suspensory ligament of the liver without giving rise to any symptoms. A few large cysts, evidently of this congenital origin, and situated about the suspensory ligament have been subjected to operation and reported, and it would appear that

these belong to the class of small quiescent congenital cysts which have taken on rapid growth owing to the action of some inflammatory or irritative influence (4). Henderson from Mayo's clinic has recently reported a successful removal of a cyst from the round ligament of the liver of the size of a child's head. The tumor occupied a position in the right hypochondrium (7).

It is at once apparent how little the case here presented resembles any of these; our final diagnosis being based on the slow onset with tumor in the middle line high up; from its developing along the left rather than the right side of the abdomen; from its relations to the stomach, colon, and gastrohepatic hgament, from its evident lack of connection with kidneys or mesentery; from its lack of resemblance, attachments, or development along lines followed by cysts of spleen, gall-hladder, suprarenals of liver.

Whether the tubercles were secondarily deposited in the cyst, or whether the cyst was a result of tuberculous infection of the gland, we are not prepared to say.

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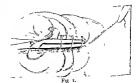
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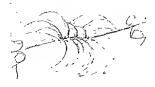
A SELF-INVERTING SUTURE FOR THE APPENDIX STUMP

BY WILLARD BARTLETT, A M, M D., St Louis

NE may preface the description by stating that the writer hesitates to add one more to the existing large number of proposals for treating the appendix stump, most of which are no doubt thoroughly useful.

This stitch is quickly put in and is self-tucking. Thus one avoids the difficulty which is very often encountered, of inverting the bowel after a pursestring has been introduced. It dispenses with the en masse ligature by scrupulous care in ligating separately any blood-vessel which is divided on the intestinal wall, as well as those in the







mesenteroleum. Fig x illustrates the introduction of the suture. Fig. 2 shows forceps withdrawn, and the suture partially drawn taut at the same time inverting the bowel Fig. 3 makes



L'AZ

clear the completion of the operation; the ends of the thread being tied together, thus invaginating one line of sutures and forming another layer, making it all the more reliable.

AN UMBILICAL CORD CLAMP (PRELIMINARY NOTE)

By FRED L ADAIR, M D, MINNEAPOLIS

Assurant Professor of Observices and Gynecology, University of Minnesota

CLAMFING the umbilical cord has some advantages over the ordinary methods of ligation. I shall not enumerate them at this time. Most of the clamps used for this purpose are heavy and unwieldy. I have devised and used a simple clup, in a small series of cases, with considerable satisfaction. These clips are cut from a sheet of alumnum, such as dentists use for plate work. They are 5 cm long, 9 cm wide, and gauge No 19. They strip is ground smooth and bent near the middle. On one end a Inttle projection is made, long enough to be bent over the free end after the clamp has been applied to the cord.

After the cord has ceased pulsating, it is compressed with a pair of artery forceps close to the skin margin

The clip is then stipped into the compression, one arm on either side of the cord. It is then squeezed tightly together with the artery or needle forceps, and the little projection bent over the open end. The cord is then cut close to the clip.

The accompanying drawings show the clip before it is bent (Fig. 1), ready for application

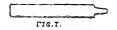






FIG III.

(Fig. 2), and its position after compression (Fig. 3).

This may be removed subsequently, or left in place until it falls off with the cord. This usually takes place about the third or fourth day

EDITORIALS

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JANUARY, 1913

INTERNATIONAL ABSTRACT SURGERY

The new International Abstract of Surgery, which will be issued by SURGERY, GYNECOLOGY AND OBSTETRICS as a supplement to that journal will appear with the February issue

The scope of this new venture was described in an editorial in the November number of SURGERY, GYNECOLOGY AND OB STETRICS Because of uncompleted contracts with the publishers of the foreign periodicals with whom we are to co operate in this important innovation, we considered it premature to announce the names of these journals. Besides, as SURGERY, GYNECOLOGY AND OBSTETRICS is the official journal of the Clinical Congress of Surgeons of North America, the editor was anxious to receive the stamp of approval of that body on his negotiations with the foreign publications.

and his plans for the organization of this departure.

The following resolution introduced by Dr. J. Bentley Squier at the business meeting of the Clinical Congress of Surgeons of North America, held at the Waldorf-Astoria, Nevermber 12, 1912, duly seconded and approved by a unanimous vote of the Congress, conveys the authority sought and also gives the exact names of the periodicals and the publishers with whom contracts have been made.

"WHTEREAS, Dr Franklin H. Martin, Managing Editor of the official journal of the Clinical Congress of Surgeons of North America, has entered into an agreement with the editors and Julius Springer, of Berlin, publisher, of the new Zentralblatt for Surgery and the new Zentralblatt for Gynecology, viz:

'Zentralblatt für die gesamte Chirurgie und thre Grenzgebiete' 'Zentralblatt fur die gesamte Gynakologie,

Zentralblatt fur die gesamte Gynakologie, Geburtskilfe und shre Grenzgebiete'

which have been authorized by the German Surgical and the German Gynecological Congresses, respectively, and also with the editors, Masson & Co., of the Journal de Chrunge of Paris, France, for the purpose of establishing an INTERNATIONAL ABSTRACT of SURGERY, which will be a supplementary journal to SURGERY, GYNECOLOGY AND OBSTETERS.

"Be it resolved, that we, the accredited members of the Clinical Congress of Surgeons of North America, at its annual meeting for the transaction of business, do hereby commend and confirm the agreements and understandings entered into with these foreign organizations, and further wish to emphasize our loyalty to and support of this new progressive enterprise of the editor of our official journal"

THE NEW BUSINESS ARRANGEMENT WITH SUBSCRIBERS

SURGERY, GYNECOLOGY AND OBSTETRICS with the supplement, the new INTERRATIONAL ARSTRACT OF SURGERY—the two combined doubling the size and cost of publishing SURGERY, GYNECOLOGY AND OBSTETRICS as it now appears — will be sent to all paid subscribers of the journal until May, 1913, without additional cost. This will give our subscribers an opportunity to judge of the importance, to them, of this change and to realize, judging from a business standpoint, that the journal publishers will be obliged to ask a proportionate increase in the subscription price

Theoretically, the price of the two publications should be double the present one. This is based on more than double the presswork, paper and mailing price and still greater proportion of compensation for the preparation of the contents represented in the index and abstracts, besides the subscription cost of a complete list of journals of the world from which the index and abstracts are made.

While these things are true, it is obvious to any business mind that there are a considerable number of general expenses connected with the publication and exploiting of a single journal that would not be doubled by increasing its size, if it was still issued as one publication. If there is considerable demand for the breaking up of the journal into two or three separate journals, as for illustration, (a) SURGERY, GYMECOLOY AND DESITEMES in its present form; (b) SURGERY, GYMECOLOY.

OGY AND ORSTETRICS combined with the surgical abstract journal; (c) the surgical abstract or the combined costs would be more than doubled. It is, therefore, the desire of the editors to publish one comprehensive surgical journal, combining the requirements of all surgeons, for one price.

Because of this desire, there will be a three months' try-out of the two publications under one cover, during which time there will be no increase in price to our cash subscribers. In the meantime, an extensive campaign will be conducted among our present subscribers with the idea of determining their wishes in the matter. If, as we hope, a large proportion of the present subscribers welcome and support the one journal and a substantial interest is shown in the new enterprise by surgeons who have never been subscribers to the present journal, it will be continued as one publication.

A great expense is involved in this new enterprise. For one year extensive negotiations have been conducted with foreign editors and publishers and important contracts have been negotiated Considerable capital is required to begin this new publication, to pay for material, to pay for journals, to pay for proper publicity. It is not only a problem for the publishers, but it is the most important literary problem that has been presented to the surgeons of America and Europe in this generation

When our readers have had an opportunity of judging of the worth of our efforts, we hope they will show their appreciation by assisting us to decide how we shall furthish them the material, and be as loyal in their financial support of the journal in the future as they have been in the past.

FRANKLIN H. MARTIN.

102

THE CANCER CAMPAIGN

One evening of the Clinical Congress of Surgeons of North America was given over to the consideration of cancer of the uterus. It has long been realized that most of these cases reach the surgeon too late for operation, and it was apparent to all that the medical profession must wage a campaign of publicity if the women of the country were to be made aware of the fact that in the early stages of the disease a large number of the cases could be cured by operation.

Former educational campaigns, aiming to enlighten the general practitioners as to the necessity of referring all cases of cancer to the surgeon early, have proved of little value, simply because the physician as a rule sees the patient but a few days before be or she is referred to the surgeon. It was therefore clear that it was the people, and not the physicians, that should be educated.

If the legal fraternity wishes to enact a new law or if a given society wishes to carry on a campaign they at once go directly to the people, using the daily press as a medium. The daily paper is, as was recently aptly described in an editorial, the primer of the people.

The Clinical Congress appointed a Committee of five consisting of Dr. H. C. Taylor, 32 West 50th St., New York, Dr. E. C. Dudde, 32 N State St., Chicago; Dr. C. Jeff Muller, 124 Baronne St., New Orleans; Dr. F. Simpson, Jenkins Arcade Bidg., Pittsburgh; and Dr. Thomas S. Callen, as Chairman, 3 W. Preston St., Baltimore, to wage this campaign, and explicitly instructed them to write or have written popular articles on the subject of cancer and to have these published in the daily press, the weekly or monthly magazines, or journals as was deemed most expedient. The resolution creating this board was unanimous.

This cancer campaign question was reopened at a session of the Congress a day or two later and the scope of the Committee was enlarged to include all forms of cancer that may attack the race.

Already some of the best known magazines have asked for articles on cancer. In the course of a year it is hoped that the people of the United States will be able to find, in the current literature that they are accustomed to read, simply written articles on every variety of cancer about which they should have a clear knowledge. When the laity realize that cancer in its early stages is a local and not a blood disease, and that if taken in time at least as per cent of them may be permanently cured, then they will present themselves early for treatment, instead of as now seeking to hide their malady until, as a result of pain or their weakened condition, they are forced into the open and are compelled to seek medical and surgical advice,

which then can offer little or nothing.

Every reader of this journal fully appreciates the great need of this campaign of enlightenment and education, and the Committee may rest assured of the heartiest co-operation of the physicians and surgeons of the United States and Canada

THOMAS S. CULLEN

TRANSACTIONS OF SOCIETIES

CHICAGO GYNECOLOGICAL SOCIETY

REGULAR MEETING HELD JANUARY 19, 1912, WITH THE PRESIDENT, DR. C. A. PADDOCK, IN THE CHAIR

SARCOMA OF OVARY

DR. M. T. GOLDSTINE: The tumor in this case was not larger than a navy bean, and no other tumors could be found elsewhere. The sections are those of a small spindle cell sarcoma.

ECTOPIC PREGNANCY

DR. M. T. Goldsting: The patient had a primary and a scendary rupture, the pregnancy continuing until about the fourth month, when I operated. The placents was well developed and had attacked itself to all the surrounding organs. It apparently received most of its blood supply from an attachment to the omentum. The section shows the chorlonic villi. The patient did well after the operation.

The second specimen is one of spontaneous miscarriage of a twin pregnancy with both sacs intact. One sac was ruptured after delivery, the other was intact and contained a fœtus.

FIBROID OF THE UTERUS WITH SEVERE HAMOR-RHAGE

DR. ROBERT T. GILLMORE: Report of case Mrs. X., married. 43 years of age White Occupation, housewife.

Ilistory of the present illness: November 8, potry, the patient had such a profuse uterine harmorrhage that she fainted ten or fifteen times before the kamorrhage final to the fore the such such as the first of the such as the first of the

Past history: During childhood she had some of the children's diseases, but could not recall what they were. She had had three miscarriages from ten to eighteen years ago with good recoveries without operation. No children. Ten years ago she was told that she had a submucous broid and an operation was advised. She was

curetted and there was some improvement in the hamorrhages of which she had complained for about six months after the operation.

Menstrul history: She first menstruated at 12 years ol age, 28-day type, fave or six days duration, and not painful. Six years ago it was of the 28-day type, duration 7 days, and painful. For the last year the duration was from seven to eight days, ten to fifteen days apart and about every other menstruation was quite profuse.

Family history: Her father died at 69 years of age, cause unknown. Mother died at 44, of pulmonary tuberculosis. One sister living and well. Her mother's brother had tuberculosis, grandmother on her mother's side had a fibroid tumor of the uterus, and her aunt on her mother's side had a fibroid tumor of the uterus

Examination: Patient weighed 170 pounds, with a yellowish white appearance of the skin. Mucous membranes white; pulse 130, regular, of good quality Temperature 98°; heart and lungs normal, urinalysis negative.

Petvac examination: Rimanual examination demonstrated uterus anterior freely movable, slightly irregularly enlarged, hard and nodular, four and one half inches in length. Diagnosis, uterine fibroma.

Treatment: Patient was given plenty of fresh air, rest in bed with nourishing diet. For the control of the hæmorrbage, cotarine hydrochlorate x gr. hypodermically, 3 times daily. An operation advised as soon as her general condition would justify, with special care at her next menstrual period so there would not be a recurrence of the uterine hæmorrhage if it could possibly be avoided. She was sent to the hospital December 10th, about one month after I first say her.

Her blood count: Reds 4,000,000, leucocytes 6,000, hamoglobin seventy per cent. She was still weak; was unable to be out of bed. By about December 22nd, she had regained considerable physical strength, was up and about with the

signs of another menstruation commencing. December 24th, she was given scopolamine and morphine, followed by an ether anaesthetic, and supravaginal hysterectomy: was performed and her appendix removed. The only difficulty in the operation was that the ouzing was controlled with difficulty. She made an excellent recovery from the operation and at present is in good health and able to attend to her household duties.

Pathological specimen: Macro-copically the specimen presented was a multiple fibroma of the uterus. The length of the uterus four inches; irregular, with four fibroids, two submucous, one intramural, one cervical, color white, no exidence

macroscopically of any secondary change. Conclusions: This case illustrates: I'rst, the slow growth of a large number of uterine fibroids, the clinical evidence showing it must have been present ten or twelve years, second, a fact generally conceded, that is, the nearer the tumor is to the endometrium the greater is the hamorrhage, being probable that this submucous tumor was the cause of her severe hamorrhage; third, the submucous tumors were not larger than hazel nuts. which would demonstrate that the size of the tumor has no relation to the severity of the hamorrhage, deaths having been reported from submucous tumors one-quarter of an inch in diameter; fourth, in obscure uterine hamorrhages the interior of the uterus should be explored with the finger, it having been previously dilated with tupelo tents.

Discussion

Dr. H. F. Lrwis: The question arises whether we should remove the entire uterus in these cases. When we do not examine histologically, there is a probability of leaving some surface which may contain malignant cells. Shall we do a complete hysterectomy or a subtotal operation?

I was led to this thought, particularly by a case that occurred recently where there fad be a fairly large fibroid in a maiden woman of sity. There had been a supravoginal hysterectiony done about six months before take the fad to me to take care of her until her death, which was caused by a carcinoma of the cervit. There are more carrinomas in fluorid uterl than in the others

DR. T. J. WATENS: Where there is any suspicion of the cerviv being dissend it is best to do a complete hysterectomy. Most of the men who speak of removing the erec is say that it is a trivial affair. It only takes five minutes longer. From my own experence I am impressed with the fact that to complete a provided hysterectomy. Lever pan who does the complete constation will occarence that the complete constation will occasionally get some annoying bleeding in the base of the broad ligament, or have a ligature break, or a vessel contract. It would seem to me that no one is justified in doing a complete hysterectomy in preference to a supravaginal hysterectomy without some pretty definite Indication. The operation is more severe, and there is more danger of accidents, such as injuring the bladder or ureter.

Ds. Exit. Rivs: I do not agree that an abdominal total hysterectomy is much more of an operation than a supravaginal amputation. I do not agree with the many statements made that there are such large numbers of fibroid that there are such large numbers of fibroid that undergo malignant degeneration and that therefore every fibroid should be treated as a malignant tumor and be removed as radically as possible.

Many fibroids has elseen declared to be on the border line between sarroum and fibroid. Every expert pathologist whom I have consulted about these cases reduces to make a positive started When you have a fibroid rich in cells, cells with much more protoplasm than usual around the nuclei, and the rest of the tumor shows a perfect capsule and no invasion of the surrounding tissues, it is hard to prove that there is any malismant degeneration.

The idea has gained ground ammig practitioners generally that every filmoid is extremely subton undergo acromations degeneration. I cannot find that m my own experience at all I make it a rule to take a piece out of every fibroid that I remove, taking a piece that looks most atomati, and make sections. I have had two sarcomas of the uterus in the fiftern parts that I have been in this city, and those did not look like ordinary limited at all. They were plain sarcomas. One of the patients is dead Irom recurrence, the other I have lost track of completely.

As to the frequency of carcinoma in shorod, why do we hear so much of that? First of all, uteri which we take out for fibroid can be canned, and we can find the carcinoma when there is one, and of the uteri which are not take nout, we do not know whether they contain a carcinoma or not. I have operated on over one hundrad eighty fibroids, and I never saw and eighty fibroids, and I never saw that I left the certical them. I left the certical them I left them I

As long as we do not know more of the origin of cancer than we do, I would not be willing to accept the statement that fibroids have any thing to do with the origin of carcinoma. DR. GILLMORE (closing): In my case we had to consider the fact that the patient could not bear an operation very well because of the shock due to the loss of considerable blood, and it was difficult to get her into shape for an operation; and even then there was considerable oazing which it was difficult to control, and it was not advisable to prolong the operation even for a short time. Of course, when we are speaking of operations that can be done on patients in bester physical condition, we can take out the cervix. I would not do it because I do not believe that the percentage of cancers would justify one in doing that operation, if it adds anything at all to the mortality.

DEATH FOLLOWING HEBOSTEOTOMY

DR CHAS S. BACON: The patient was a primipara between twenty-six and thirty years of age. Three or four years ago she had a long ilmess of obscure origin and nature for which, after a considerable course of treatment, she was sent to a hospital for several weeks. She was turned over to the gynecologic service. A laparotomy was done and the appendix remode because of chronic inflammation. She was never well after this illness.

I saw the patient yesterday after she had been in severe labor for 40 hours. The labor began four days before the operation with a few pains and rupture of the membranes. When I saw her she had pains lasting from a minute to a minute and a half, with an interval of less than a minute. The child was in serious condition, heart tones running between 80 and 220. Patient had a temperature of 100 8 The pelvis was flattened, the conjugata vera I estimated at 8 cm., the diagonal being a little below ro. The cervix was dilated to nearly half. The head was in the inlet and some molding was beginning. The occiput was to the left; the sagittal suture transverse and the large fontanelle to the right. It was nearly a bregma presentation. The bladder was very much overdistended, efforts to catheterize had failed. I could push the head out of the pelvis to some extent with some trouble. urine when withdrawn was somewhat bloody.

It seemed doubtful that the woman could bear the child spontaneously. The only operations I could consider were hebosteotomy, or extraperitoneal section, which I had never made This was my fourteenth hebosteotomy and all the mothers and children had been saved, consequently I preferred that operation. The vagina was rather small; the vulva did not admit the hand, so I made an epysictomy on the left, ex-

tending the incision up into the vagina two or three inches. Bleeding was free and necessitated the clamping of some vessels. The cervix was act anteriorly and posteriorly, two and three inches respectively. The bone was cut subcutancously on the left side in the usual manner, and with less harmorrhage than usual The head was pressed into the pelvis after the separation of the hones to ahout 5 cm. The forceps were applied and the child extracted. It was somewhat asphyxiated hut was easily revived and lived.

I sewed up the incisions in the cervix before the removal of the placenta, which I always do. I found a tear on the left side of the vagina extending to about two or three em of the cervix. This I repaired and also the incision on the right. There was not much hemorrhage. The placenta was then expelled A hot douche was given and a bandage applied around the pelvis. The patient was put to bed The report from the amasthetist was that the pulse had remained the same throughout the operation, about 120, but that it was a little weaker toward the end of the operation.

After I had attended to the baby, I returned to the mother and found her having some difficulty with respiration and the radiat pulse was not very good, about rac. I gave her 600 c. of salt solution and one-third grain of morphine in two doses, which I have found to be very valuable in these conditions. The pulse improved and I left the patient. A few hours later another injection of salt solution was given. At seven o'clock in the evening she became worse, and died shortly afterward, about seven hours after the operation

A postmortem examination was not permitted so that I cannot give the cause of death. Of course, I would think of rupture of the uterus, embolism, concealed hamorrhage and shock, I do not think that air embolism can be considered. If rupture did occur, it did not extend through the cervix, and the placenta was in the uterus until the end of the operation; the uterus remained hard and firm all the time. Concealed hæmorrhage could hardly have occurred from the uterus although there may have been a hæmorrhage from the bone. There was no evidence of hæmorrhage during the repair. It was probably simply shock in a woman with an injured heart due to previous infection, from the long labor, the operation and the anæsthesia.

DISCUSSION

DR. CHANNING W. BARRETT: This will probably go on record as a death due to the hebosteot-

omy, although Dr. Bacon does not claim it to be such. Bad results are not due to the operation, but to delay in operating. This patient did not bleed much, although she had been in labor a long time and there was reason for her being exhausted. Then there was the incision into the various and some harmorrhane from that.

As to whether a hebostcotomy should be performed on a primipara, I have been rather careful to massage the pelvic floor and dilate thoroughly before doing the operation, as we would do for a prelimnary forceps operation, getting a good dilatation first. After doing that I have sometimes had no trouble whatever. But the operation is justifiable even in a primipara, when the patient has been in labor so long that Cæsarean section is not desirable and yet a living hably is to be delivered.

OVARIAN TUMOR COMPLICATING PREGNINCY, DE-LIVERY AND PUREPERIUM. — DR. CHANNING W. BARRITT'S PAPER APPEARS IN THIS ISSUE.

(SEE P 28)

Dr. Cras. S. Bacon: Dr. Barrett has made out a strong case in every respect but one. There is no doubt that the tumor grows in size in the majority of cases, and that it is apt to become twisted. Why that should occur during the pregnancy is not clear except it be that when the turns is raised up out of the pelvis it displaces the tumor and gives it greater mobility. The results show that there is no question as to what should be done. As a rule, as soon as the tumor is discovered it should be removed.

The first question is, have we a tumor or simply an enlarged Graafian follicle or an enlarged ovary with numerous Graafian follicles. That will require careful study, as seen by the history of a case which I will give in brief. I once attended a woman during labor After the labor I noticed a small mass at the side of the uterus. It decreased somewhat in size during the puerperium and it did not cause any trouble. At the next pregnancy, three or four years later, the tumor became very large and had to be removed. Even when I had the opportunity of studying this tumor after the first labor I still was in doubt as to its nature, so much so that I did not operate. Its nature could have been determined much less easily during the first pregnancy.

The only instance where I would have any doubt as to operation during pregnancy is in double tumor during the latter months of pregnancy. During the sixth, seventh and eighth months of pregnancy there is a greater tendency

to abortion after operation. Supposing a woman has a double tumor, and this means that this is probably her last pregnancy. Here is a case where one might prefer to wait, in the absence of scrious symptoms, at least until the ninth month or even until after labor.

The point on which I would be inclined to differ with Dr. Barrett is the method of teating the tumor during labor. I believe that it is seldom that one cannot remove the tumor from the pelvis. If it is an obstructing tumor, and the head is not much engaged, it can be pushed up out of the way, the tumor displaced, and labor can proceed. Two or three days afterward the tumor can be removed.

Dr. Rudouph W. Holmes: I have had some six ovarian cysts in an obstetric relation, besides a very considerable number of small ones which

were of no significance.

The first one was a patient upon whom I had to perform a Carsarean section after hours of obstructed labor, and where repeated examinations had been made by the various consultants. The cyst was equal to the size of a man's head, was firmly adherent to the cul-de-sae, and almost completely filled the pelvic brim. The baby was alive at the time of operation, but unfortunately was not resuscitated from its condition of appear After removing the child the cyst was removed with considerable difficulty, on account of the dense adhesions. The woman recovered. The next case I saw in consultation, the cyst held nearly a gallon of fluid, and was easily removed The other ovary was normal. The woman completed the remaining four months of her pregnancy, and completed her primiparous labor spontancously; some six months later she returned, presenting the appearance of a six-months pregnancy; a cyst of the ovary was removed equaling the size of the former cyst. She recovered.

The third case was interesting not because of the size of the cysts, but from their location and adherence to the cul-de-sac The woman came to me with a history of a confinement some eighteen years previously; some ten years ago a member of our society advised the removal of both ovaries which were causing considerable distress. This was refused, and she then took local treatments from another physician fairly consistently until she came to me in her pregnancy. I found both ovaries enlarged to the size of lemons or larger, and firmly lodged in the cul-de-sac. With the advance of pregnancy the tumors were elevated to the brim, carrying the posterior fornix upwards. My advice was that these tumors should be removed on account

of their influence on labor. The recommendation was rejected. As the time of labor approached the head was found eccentrically placed, abnormally movable even for a parous woman. At this time my conviction was strong that the woman's interests would be conserved as well as the baby's life safeguarded by an elective Cæsarean on these grounds: while the woman did not nossess a contracted pelvis, yet it was a low normal, the tumors still to a considerable extent held the head out of the brim, the danger of their rupture would seriously compromise her health if not her life, finally the necessity was fairly definite that operative interference would be indicated to terminate the labor, with its risks to her and the child. My feeling is still strong that a conservative section with the removal of the tumors was less bazardous than the operative obstetric delivery with the later removal of the cysts Labor occurred, for hours the head remained above the brim; at each examination the cysts were palpable Finally the necessity arose for terminating the labor; high forceps were applied, with the descent of the head the tumors disappeared. The child was alive just before the instrumentation, but was born dead, death being due to a short cord, not six inches long, with a true knot drawn tightly which had cut off feetal circulation. For days the woman suffered only as a laparotomy patient suffers who does not do well, she had excessive nausea. distressing gas pains, with a tympany distending the abdomen to the limit. Examinations failed to find the tumors. A consultant failed to find a vestige of the tumors. Some months later the patient fell into other hands. This physician failed to find anything wrong in the pelvis. likewise a consultant called by him. However, over a year and a half after her labor the abdomen was opened, and the pelvic findings corroborated the pathologic condition pictured by me.

Last year I removed a dermoid of the ovary from a woman in her third month of pregnancy, she went to term and was delivered of her child

spontaneously.

Then I saw in consultation a woman in her purperfum which were interpreted as appendical; her blood count was over twenty thousand. The pain wandered over the abdomen, and a registance was palpable over the center of the painful area. On opening the abdomen, a cyst the size of the fretail head was found with a double twist of the pedicle. The fifth case was an infected ovarian cyst in the purperfum which I

removed after the subsidence of the acuity of symptoms. She recovered.

I would lay stress on these points; (i) it is not always the large ovarian tumor which causes the most difficulty in the obstetric relation; (2) a large tumor may remain above the brim and cause no symptoms, while a small one may be adherent in the pelvis, offering sufficient obstruction to prevent a safe delivery; (3) a small tumor, especially in the puerperium, may become infected as readily as a large one, (4) while the large cyst is more prone to torsion of the pedicle, still a small tumor may meet this fate.

SUDDEN DEATH DURING PUEPERIUM

DR. FRANK LYNCH: A woman, 33 years of age, in her first pregnancy, passed through it in a normal way, except for a skin eruption, the result of an intestinal toxemia She came into labor Novemher roth, passing through a fairly normal labor of ten or twelve hours' duration, the first-stage pains not being hard. On internal examination the membranes were ruptured. When she came into labor there was a slight trace of albumin, and also after the labor. She passed into an apparently normal puerperium. On the third day her temperature was 100; pulse 116, and after that, except for a rise which three times passed the 90 line, there was no elevation of temperature of more than half a degree.

She got out of hed on the tenth day. Her pulse on the seventh day was 100, only twice was it in the nueties. She sat in a chair for half an hour. On the second day she took a few steps, and on the third day she walked around a bit, urnated on the toller. She complained that she was short of herath, had convulsions, and died in five minutes apparently of an embolus. The pulse apparently had been normal for some days.

pulse apparently had been normal for some days.

It was my first experience with such a case
The blood pressure ran between 85 and 95; it was

never over 100.

De Barrett (closing the discussion): One point that Dr. Bacon made was that in a case where there was no probability of another pregnancy, the case might be continued with the bope of getting a live baby. The answer for that would lie in the decision as to which gives the least child mortality, an operation that is uncomplicated, or in letting the woman carry the tumor and the child to the end of the pregnancy. I find that about 18.8 per cent of women abort without operation, if treated expectantly. In the cases that have been operated about 10 per cent of children have been lost from all causes, but the large percentage of these were due to

the same thing that caused the abortion in others. The damage was done previous to the operation. On the other hand, immediate operation will save some of the women from aborting. So that the figures would indicate that the woman stands a better chance of going to term with the tumor out of the way than with it present.

In regard to the varying degree of danger resulting from the fact that the tumor is large or small, fixed or movable, I would say that the figures show that they may have occurred probably with a small tumor as well as with a large one. They may go along fairly well or have trouble with a fixed tumor as well as with a movable tumor. The freely movable tumor oftee becomes twisted, but it does not need a fixed tumor then to make trouble. The only case of twisted tumor I had was a perfectly free tumor

THE WASHINGTON SURGICAL SOCIETY

REGULAR MEETING HELD JANUARY 19, 1912, WITH THE PRESIDENT, DR. VAUGHAN, IN THE CHAIR

Present: Drs Wellington, Hagner, Van Rensselaer, Balloch, Hooe, Carr, Bovée, Lehr, Fowler, Parker, H. H. Kerr, Magruder, Riggles, Young, Stone, Erving, Fuller, Magee, Sprigg, and Mitchell. The minutes of the previous meeting

were read, corrected and approved
The President named Drs Van Rensselaer,
Hooe, Parker, Magruder, and Lebr as a nominating committee The committee reported the
following nominations for the officers for the
ensuing year President, Dr. W P Carr; VicePresidents, Dr I S. Stone and J. Wesly Bovée,
Councilors-at-large, Drs. Vaughan and Balloch,
Secretary, Dr. Reichelderfer, Treasurer, Dr.

H H. Kerr. Pathological specimens. Dr Vaughan presented a specimen consisting of 18 inches of lower bowel, including sphincter, the last 4 mches of the specimen being cancerous, the case was a lady, 60 years of age. Dr. Stone removed the uterus 16 years ago, for fibroid tumor. One year ago she began to have pain and discharge The growth was easily felt and caused almost complete obstruction. Sigmoidostomy was done on left side, the bowel cut and upper end anchored. Three weeks later laparotomy was performed, the rest of the colon dissected down, vessels ligated, glands removed from sacral promontory, the peritoneum and bladder being dissected up The operation was completed by the vagina; there was no harmorrhage but patient died in 48 hours. This method of operating has heen variously named, but is best described as

the "combined" operation.

He reported a second case of a boy of 20, who for years had hid more or less rectal bleeding. For several months past had gone down hill and lost much weight. A mass could be felt 2 or

3 inches above anus, which would barely admit the finger. In this case an incision was made in the penneum to the left of the anus and the rectum separated for 4 or 5 lenks. Further progress was impossible from below, and the complete separation of the bowel was secured by laparotomy. The operation was resumed by the perineal route and a section 4 inches long was pulled down and removed, leaving a lower portion 13/f inches long containing the sphiniter. The bowel was sutured, and gauze drain inserted along bowel. The bowels later moved easily and freely and so far the patient had done well

In discussion, Dr Batzoez especially commended the combined method of removing rettal growths as being vastly better than other methods accurated, especially the Krache operation, though Krache advocates the preliminary lapirotomy, the combined operation offers better facilities for inspection and removal of glands,

De Boyés approved the combined method, working from above first. It is very desirable to preserve the sphincter, if this cannot be done, it would be just as well and easier to perform a colectomy.

Dr. H. H. KERR asked if the case could possibly have been one of diverticultis, as the mucous membrane seemed quite normal and the age of the patient only 20, but Dr. VAUGRAN called attention to ulceration present and stated that there was glandular involvement

Dr. H H. Kerr presented a specimen of epithelions of the anus he had removed from a man of 65. There was a caudiflower mass in front of the return evidently from the musculocutaneous margin. The inguinal glands were involved. The mass was dissected up from the

perineum, the sphincter and levator muscle removed and normal bowel brought down into the wound. The fascia to the side from the glutcal muscle was transposed to serve as a new perineal base; be expects later to dissect out any involved elands.

DR. Bovée, in discussing Dr. Kerr's case, believed it would have been better to bave done the laparotomy first and thus the affected tissue nearest the vital organs removed first, thus

lessening danger of further spread.

DR. LEHR reported a case of a man who had painful and frequent micturition, especially in the day, for two months there had been some pain and blood at the end of micturition, the pain being referred to the end of the penis. The first glass of urine was cloudy and the second contained some blood. The symptoms pointed to probable stone, but cystoscopy showed a papillomatous mass at the trigone involving both urteers. Dr. Browft said a parpilloma might float into the urethra and cause pain and bleeding at the end of urination.

DR. HAGNER stated that the case of removal of the bladder and implantation of the ureters which he had reported at the last meeting had lived 2 weeks: there was plentiful secretion of urine, but symptoms of pyclitis developed There was also marked stinging and burning from the urme passing through the bowel and anus He had decided that he would never again use bowel implantation, as drainage into the back had so much to recommend it Dr Boyés said that such irritation was the rule. Fowler and Peterson both describe it, there is frequent emptying of the urine from the bowel, though toleration is gradually established and the urine may be retained to 3 of 4 passages a day in some cases Dr FOWLER mentioned a case of urethrorectal fistula where there was little scalding or pain in the bowel

DR. FOWERE reported a case of stone in the kidney presenting the ordinary symptoms in which the stone was removed two years ago Last summer some symptoms reappeared and the X-ray showed another stone which was easily removed. The urine had showed no alteration from the second stone. The point of interest was the recurrence of stone in the sumkidney pelvis without urinary changes, an occurrence which the buoght must be rare Dr. Bowles said that Cabot reports several cases of operation for recutrent stone in the pelvis and ureter, but whether with urinary infection or not he did not know.

DR. BALLOCH reported an unusual case of hernia, of which he exhibited a photograph.



Photograph exhibited by Dr Balloch

"This case is reported for two reasons: first, because it is the largest ingunal hernia I have ever seen in a woman, and second, because, in spite it is size and long duration, there were no adhesions whatever, an unusual occurrence in such an old and large hernia. The absence of adhesions may be accounted for by the fact that the patient had never used any retentive apparatus nor had she ever made any applications to the hernia.

"The patient was a colored woman, 52 years of age, who entered Freedmen's Hospital, January 8, 1912. She was a laundress hy occupation Family history negative, so far as concerns the heria. The principal item of interest in her personal history is the fact that she has had ten children, the last one having been born in 1900. Her labors were always difficult, lasting two or more days. She has always been attended by a midwife and no instruments were ever used to hasten delivery.

"The hernia was first noticed in 1897. It began as a budging in left inguinal region, accompanied by slight pain. The budging arcsessed in saxe slowly, as dd the severity of the pain. At times she would reduce the hernia, but it would return shortly afterward. Even in the recumbent position it would not go back spontaneously. In 1990 the pains grew worse, radiating antennas and any relieved by vomiting. Has always suffered from obstitute construction, the bowels moving only when a cathartic was taken

"Learning to a series a proper a market and man Abdorrad walls soft, though have afti-Abdones rather scaplant I rom left loyunal region hauge a pendulop may, 25 cm in length and 12 cm. in its largest diameter. The mass to continuous with the left labour marge and reaches much to the line. Peritaine waves are visible and purgling is beand when the to a recommendated. I per per union masses of tympany are detected. When the patient hes down the cetire contents of the turnor can be returned to the abdominal casity through the left meginal more which is 6 cm, ro changeer Degrees, left regular berna, contaming gut and omentum. On account of the reducible nature of the contents operation was advised

"Operation, January 72, 1912. The onlineary terma indepensavamed. The saw, who opened was empty, there being no adherons either of yot or omentum to the sactor to each other. The near and redundant sain were cut off together and the wound closed in the usual manner, Herhing asoptic and convolvence on one could."

Dr. Mircett et ji discussion, mentioned a case of milation man, with an entironous ser racing nearly to the lens, he had relused to operate unless the man would consent to but and the end want to mile enough nomit it has abloured to think operation to think operation in its ablotter to the contents of the time. If does not think operation is table in many of these extreme cases.

In discussing Dr. Balloch's case, "Dr. Stone reported a case of double freguent herma in a female, in which the path it, an intelligent woman of 60 years of age, made streamers efforts to thread if the formation of a dependent berolal sac

She began by nearing trusses of various in. but these failed and she was compelled to meto abdominal support by Irm banders To result was an upturned or deflected here.'s which on the right side reached the min level lest was outside the external may and tor fore under the din On the left side the hour was much smaller but precisely similar to be on the right. The patient had carried the hanfor over twenty years and finally she bear ! have symptoms of bonel obstruction ran necesstated an operation for immedat race On the right side the greater hereial ras ra non adherent in the upper part of the harm see which was of more recent formation. The beor lower portion of the hernia was confict at separate perstoneal pouch and the born "L firmly adherent, and occlusion was so make that we were compelled to either reset or mit an anastomes to secure relief from the obar The latter rourse was elected, thingath save the patient. The bowel was finally record and the patient recovered. The larger me an not aillierent to the fascia or fat about it, rethe was the land adherent within the sac. The pressure of the hernia had produced an advititious sic around the larger hernial sac, what consisted of condensed connective tissue from which the fat was largely removed. At a selsequent operation the hernia on the left side was closed and the patient is now apparently in good candition '

Owing to the lateness of the hour, the Sodely soted to defer the reading of Dr. Fowler's payer the I the I therapy meeting. The Sodely then adjourned.

CHICAGO SURGICAL SOCIETY

REGULAR MEETING HEED MAY 3, 1912, WITH THE PRESIDENT, DR. FREDERIC A. BESLEY, D. THE CHAIR

Die Samm'r C, Promin it read a paper entitled "Dystople Klebrey."

DISCUSSION

Dr. E. R. La Court: Dr. Planmer has covered the subject so thoroughly that there is very fitte to say alout these indipated or congenitally dystopic kilneys. It is a subject very well understood, and I am sure that many of the surgeons here have knowledy or unknowingly exposed these kidneys, and some of you have unwritingly cut into them and have been compelled to remove them later.

them later.

One point I would like to emphasize is that the ureters open in the usual position normally in the blastler. I would like to lay stress on the Irequency of antiformations in women, at least with the genital organs. This is of chincal importance The case Dr. Plummer had of crossed dystopic kidney without any fresho of the red dystopic kidney without any fresho of the red.

kidneys is of extreme rarity. A dystopia that is crossed and with fusion, as he has mentioned, is not so common, and has been called, as he has already stated, sigmoid kidney. I have brought with me a specimen of that kind of tissue.

I would like to emphasize again what he has already mentioned, that in these cases where the kidneys are both on one sude, the lowermost kidney or the kidney that is in front of the other, in case they are overlapping at all, that kidney is very likely to have the ureter and vessels in front.

There is another point of interest to you clinically, and that is that where the dystopia is not crossed the malplaced kidney is small, like the specimen shown you. It is a small kidney and may be removed without any particular danger if there is another kidney, and there is usually another kidney. These are all the points that I would like to mention.

I have here a specimen that bas not yet been mounted which was recently removed from the body of a man who died from somiching connected with the kidney, and it is an example of the so-called sigmoid kidney where the kidney is used, but not in a horseshoc way. It is fused in such a way that the kidneys both lie on the same side of the body. The lusion is at the upper end of the malplaced kidney. This sigmoid kidney is not as rare as the example of Dr. Plummer's

of dystopic kidney without fusion DR. L. L. MCARTHUR: It would be jutile for me to rise to discuss a paper which embodies in itself all that is known on this subject or to be found in the literature, but notwithstanding the fact that only one such specimen is found in a thousand post-mortems, it has been my fortune to meet with three such kidneys in my operative experience. Two of these are already incorporated in the list of eighty-four cases which the essayist presents, and I rise to add to these a third case which presents so many of the difficulties which attend both the diagnosis and the handling of such cases, that I think it worth while to briefly summarize it. I have on one other occasion referred to the case, but would like to have Dr. Plummer add this to it. It occurred four years ago in the case of a young woman who was contemplating marriage, and prior to that she desired to be sure that she was a healthy woman and to learn what it was that was causing pain in her lower abdomen. She called my attention to a mass there. This mass lay in the middle line below the umbilicus in front of the last lumbar vertebral body. The mass was tender on pressure, was painful at the menstrual period more than at other times, and seemed to be quite im-

movable. It could neither be moved up nor down, nor could it be moved from side to side. It seemed from physical examination to be an outgrowth from the body of the last lumbar vertebra or promontory of the sacrum. Vaginal examination both by myself and confrères made us sure that it was in no wise connected with the genitalia. All forms of examination were instituted, even the X-ray failing to show what we thought possible from a clinical point of view might be a sarcoma of the body of the vertebra or a bony outgrowth from the bodies of the sertebræ. Any shadow here which the kidney might cause in this position could scarcely be interpreted as a kidney picture, and would therefore not aid in the diagnosis which the essayist suggests Believing it to be a serious enough affair to justify exploratory laparotomy, I opened the young girl and found to my astonishment that I had to deal with a dystopic kidney which was in my opinion a horseshoe kidney that was dystopic, and the isthmus of the borseshoe was right across, followed around and rested upon the last lumbar vertebra. But on introducing the hand into the pelvis I could feel on each side of the pelvis a typical kidney-like body which could be lifted almost out of the true pelvis, or taking the opposite side it would reverse the see-saw movement Until to-night I had forgotten that I ever knew that the kidney develops in the lower pelvis and reverses the direction of the testicle, it ascending and the testicle coming down thought that I must do something to correct the position of the kidney and therefore sought to find if the ureters of this kidney were long enough. I thought, of course, the vessels would be long enough because I imagined the kidney had descended from above Searching I found both vessels of the ureter from there nere very short, and that the kidney or kidneys that were fused took their origin from the internal iliac artery, got their vascular nourishment in that way, and the ureters appeared to be short I was then confronted with a peculiar situation. The young girl, who wanted to be married, with two kidneys fused together down in her pelvis, sought my advice It seemed sure in that position the kidneys would be so compressed as to make a fatal uræmic poisoning, as was reported by the essayist in one case, from the uterine pressure, and the question arose whether I should ligate the tubes and make the woman sterile. This I had neither her permission nor did I think of it before operating, and so was obliged to close the incision without changing the situation of the kidney, finding the vessels so short that it made it impossible to

divide the isthmus and slip that out of the pelvis. and I had no right to sternize her. The question then may present itself to any one of us again. and in the discussion of this paper by the society I would like to ask what their procedure would be under such circumstances were they to meet with such a case, and I do not feel ashamed that in this case, as in twenty five per cent of the cases collected, the operation only revealed the nature of the trouble, the diagnosis not having been made before.

DR. FRANCIS J SHEPHERD, Montreal, I have seen a good many cases of misplaced kidney, Before a disastrous fire occurred at our medical building in Montreal, I had a dozen examples which I had collected from post-mortems and the dissecting room in thirty years, and I not only found displaced kidney was on the right side in my cases, but on the left, as Dr Plummer has said, and always discold. The kidney is between the two common iliacs I do not think the explanation given of the blood supply is satisfactory at all I have one specimen in which there are seven or eight arteries going into the kidney, none into the hilum, in one case one superior mesenteric, and the other from the common sliac coming from each pole of the kidney, none in the hilum, and the hilum is not misnfaced, so that I do not think the explanation given is satisfac-

DR CARL WAGNER: I removed a Lidney last fall from a young man, thirty-five years of age, who presented himself with an enlargement on the right side near Poupart's ligament, but a little farther up. He had symptoms of pum, and this pain was so severe that he doubled up during his work. In this case we thought we had to deal with an appendiceal abscess. We found a square shaped kidney with the hilum on top, with the tip of the growth under the artery which came directly from above on the outer quadrant We removed the kidney and the patient made a

good recovery DR. DANIEL N EISCHDRATIS; I think Dr. Shepherd possibly may have misunderstood the idea which Dr Plummer tried to convey. What Dr Plummer tried to convey was that these dystopic kidneys received their blood supply from the vessel which just happens to lie in close contact with the relatively congenital position of the kidney.

There are several interesting points from a surgical standpoint that we can discuss intelligently. In the first place, these kidneys are very fixed. That is a matter of great surgical importance, because it makes such a kidney extirpation an exceedingly difficult operation, not only where there are multiple arteries, but where there is fixation of the kidney. Then, too, the very fact that the hiluminvariably points forward complicates matters It also accounts for the fact of the greater number of these kidneys - I think eighteen out of sixty-seven were hydronephrotic or pyonephrotic. We see the same condition in the horseshoe kidney, and the hilum being forward, it frequently happens that the ureter passes across the front portion of the kidney, in place of taking the usual route, and in that way it favors obstruction of the Lidney with resultant hydronephrosis.

From the standpoint of nephrolithiasis, I have had occasion to make quite a study of the relation of dystopic kidney to the subject. Let us assume this (indicating on the blackboard) to be the twelfth rib, and these the first, second, third and fifth lumbar vertebra. I have made it a point, where I see a kidney shadow which I do not suppose, without special examination, is due to a shadow in the ureter, to think of the possibility of this being a shadow of a kidney stone in a dystopic kidney I have seen quite a number of cases in which the main shadow was located about opposite the fourth or third lumbar vertebra in the pelvis of the kidney. It is the abdominal form of dy stopia in which the kidney lies somewhere close to the iliac crest,

The second variety, the abdominal pelvic variety, presents a typical calculus like a sacroiliac joint. That is typical for a calculus in a dystopic kidney of the second variety.

We have a third variety where the kidney lies in the pelvis proper. If we suspect from our Xray studies a dystopic kidney, there is only one way of determining it, and that is by the method of injecting collargol solution and taking pictures If we see a shadow which we do not think is the shadow of a ureteral calculus, we should make it a point in every case to take an X-ray and with the wire bougie in place. To add to Dr. Plummer's collection of dystopic Lidneys, I will say that there was published in the Presse Medicale for 1898 a case of pyonephrosis in a woman, fifty-five years of age, in which the kidney was found with in the layers of the mesentery, so that this makes the second case of dystopic kidney in addition to the one Dr. Dawbarn has reported.

CHICAGO GYNECOLOGICAL SOCIETY

REGULAR MEFTING HELD NOVEMBER 17, 1911, WITH THE PRESIDENT, DR. CHARLES E. PADDOCK, IN THE CHAR

FATAL HÆMOFRHAGE SIXTY HOURS AFTER LAPA-ROTOMY

DR. THOMAS J. WATKINS: The hamorrhage in this case took place between the fascia and peritoneum. Twenty-four hours after the operation the patient complained of a great desire to have a bowel movement. At the end of forty-eight hours she was still complaining of great adominal distention. Examination of the abdomen failed to show much distention, the hartfles were given the second morning but produced no result. In the afternoon the nurse massaged the abdomen. It occasioned much pain, the patient passed much gas and rapidly grew worse.

I saw her about fitty-five bours after the operation, at 10 r 9 m. She had an immense blood clot which dissected the peritoneum off on either side to the muscles of the back. Percussion showed a very distinct tympany all over the abdomen. The pressure had four the peritoneal sutures and there was much blood in the peritoneal cauty. Yet this gave no dullness in the flanks. The hæmorrhage had come on so gradually that there were none of the usual signs of hæmorrhage. There was not as much pallor as one would expect. The bleeding had been slight and absorption was going on all the time.

On opening the abdomen we found a large blood clot. The peritoneum was found stripped off; the sutures had given way and the blood was in the abdomen, but there were not many clots in the abdomen. The original operation was a hysterectomy. The peketic was normal We cleaned up as quackly as we could, but the loss of blood was so great that the patient died.

The cause of the humorrhage was interesting. The wound was dry; more so than usual. The only possible explanation would be that in subtring the fascia the needle passed through a blood vessel in the rectus muscle and it bled.

I know of one other case of fatal harmorrhage following the removal of an appendix where the deep epigastric artery was punctured. My patient may have had an anomalous deep epigastric artery or an unusually large vessel in the rectus muscle It is impossible to avoid such an accident.

DR. CHANNING W. BARRETT: A woman entered the hospital with the history that thirtysix hours before she introduced a crochet hook into the uterus to produce an abortion. She left it in place for a few hours and when she reached for it, it had disappeared. Instead of waiting for peritonitis to develop she entered the hospital at once. I explored the uterus, but found nothing. There was no evidence of pregnancy. We opened the abdomen and found the crochet hook, which had passed through the fundus of the uterus. The opening into the uterus was closed by a piece of omentum which had already become adherent and there was not the least sign of blood in the abdominal cavity. There was a little irritation of the peritoneum from the presence of the hook.

DR. HERBERT MARION STOWE: CASE 1. Mrs. M., age 35 years. Family and personal history negative. The first child was born in July, 1906. Labor lasted thirty-six hours and delivery was accomplished by a difficult forceps operation. The child was dead and weighed 7.5 pounds. second child was premature and was born normally This child still lives. The third labor occurred in February, 1909, and was terminated by a difficult craniotomy after thirty hours of uterine contractions. patient entered my service at Cook County Hospital, December 20, 1910, giving a history of thirty-one bours of futile labor pains. Two physicians had attempted to deliver but failed. The patient was of medium build. Heart, lungs and kidneys negative. Pulse 96, temperature 976° F. The foetal head lay over the fundus with the occiput on the left. No obliquity. The heart tones were audible, 138 per minute and regular. The cervix was effaced, the os dilated and the membranes ruptured. The pelvic measurements were I. S. 26, I. C. 30, Baudelocque 19 cm., the internal diameters C. D. 11.5, C. V. 9, Transverse of the inlet 13, bi-ischiatic 10 cm. The sacral promontory projected into the inlet. The leucocyte count at the time of admission was

On account of the previous manipulative efforts to effect delivery and the probability of septic infection, an abdominal delivery was rejected. Embryotomy was also excluded as the fortal

24.050.

heart was audible. A cautious attempt was made to deliver with the high forceps but two strong tractions showed the futility of such a procedure. With the forceps still in situ, the Gigli saw was introduced in the left side and the section completed in a few minutes. After the section the head was easily drawn into the pelvic cavity and delivered at once. The child weighed 7 pounds and 12 ounces and breathed in a few minutes. The parturient tract was then examined for lacerations and none found. The uterus was packed and the patient put to bed in good condition. On December 24th, the left leg was swollen and was tender to the touch but no veins could be palpated. The condition subsided rapidly. The patient made an otherwise perfect convalescence and left the hospital on January 12, 1917. This woman was seen by me one week ago and both she and the baby were found to be in good condition The mother suffered from no disability and was able to attend to her household duties as well as ever.

CASE 2. Mrs. W., age 2r years Family and personal history negative. Her hrst child was delivered in October, 1970, after a labor of sixty-one hours. A difficult forceps operation resulted in the extraction of a dead baby. The child was

evidently killed by the forceps

She entered the Cook County Hospital on July 10, 1011, after a labor of thirty-six hours Several efforts had been made to deliver her and she had been under an anæsthetic for over three hours Heart, lungs and kidneys negative The head presented over the inlet in Naegele's obliquity, the occuput being on the right head distinctly overlapped the os pubis fortal heart tones were 164 and regular though weak The abdomen presented the usuaf findings of threatened uterine rupture and Bandl's ring was plainly visible. The cervix was dilated and efficed and the membranes ruptured. Mother's pulse 148, temperature 102 6° F the method of delivery in this case lay between embryotomy and hebosteotomy, the child was given the benefit of the doubt although meconium had been passing for six hours. The true conjugate of this pelvis was estimated to be 8 cm

Hebosteotomy was done immediately and the child was delivered at once by forceps. The operation was moderately easy. The child was asphyviated but revived in 15 minutes and lived Internal examination showed no laceration of the soft tissues but revealed a greatly thinned lower uterine segment. The convalescence was uninterrupted and the patient left the hospital on 1914 52th, in good condition. This woman was

recently seen and reported herself and child to be in good condition.

DISCUSSION

Dr. N. S. HEANEY: After you applied the forceps in your attempt at delivery, did you leave them on when you did the publicatory?

Dr. Stowe: Yes, I left them on

DR. CHANNING W. BARRETT: The place for a publication; is well defined. It is applicable to just such cases as those reported where the woman has been in labor for some time, is not in good condition for a Casarean section, and where there is a living baby. There are those who maintain that Casarean section should entirely take the place of publication, but this cannot be done without including cranictomy, and cannot only should not be performed on a living didle In these cases publicationy gives the mother and child an excellent chance.

I have performed the operation six times with any recoveries of the mothers and five living children. In one case I was called into consultation late, and it was reported that the child was alive just before the publicouny. The abdomen was very thick, and although the fetal heart sounds could not be heard we did not wish to take that as evidence that the child was dead. Therefore, we performed the operation, but the

child was dead

Those who have not performed the operation are rather inclined to magnify the severity of the work. The patient has very hitle pain after the operation, gets up within three or four weeks and begins to walk around. She may have an occasional twinge of pain at the site of the operation but eventually that disappears. One patient complained of pain on moving the leg as when missing a chair with the too.

I performed a Crasarean section a few days age on a woman on whom I did a hebasteavity two years before, gettling a laving chald, although she had been a labor from Tuesday until Sunday I had much difficulty in delivering her after the hebosteotomy, and I concluded this she became pregnant sgain, I would do a Crasarea section. The pregnancy courred, the people consented to the operation, and it was done successfully.

Dr. Frank Lyrcu: The external measurements of the pelvis mean very little. A difficult labor is sufficient to show that there is a contracted pelvis. But we should emphasize the value of the internal measurements. Text-books err greatly in laying 50 much stress on external measurements. It is unfortunate that we have

no means of estimating the true conjugate, but when we measure the diagonal conjugate, we have

some data on which we can work.

DR. CHINELS S. BARON: We should determine, if possible, whether the child it allowed mine, if the beart sounds are absent, I would favor introducing the hand into the uterus, for the head is not fixed in the pelvis, and finding out the head is not fixed in the pelvis, and finding out whether the cord is beating. But even then one may be in doubt. If the cord is pulsating, however, one is pustified in performing the operation. If the child is dead, the operation should not be refronted.

There is not much danger connected with the operation, but the disability that sometimes follows is sufficient to make one he-state when the child is probably dead. It is a safer operation in cases of possible contamination than Cesarcan section. Infection is a contramilation, but the danger from infection is bess in helosteotomy than in Cesarcan.

DR. BARRITY. In my case the report was that the cord was heating. I remarted the examina-

tinn, but did not feel sure about that

DR. CHARLES E. PADDOCK. The operation of heliostectomy is not devoid of danger, as we are led to think by the remarks made here tonight. The medical literature contains many reports of this operation that have resulted in ruptures of the bladder, failures of the bone to unite, hamorrhages, and even fatal hamorrhage Still, the operation has its place and also its limits It is done in the interest of the child, and there must not be too great disproportion between the head of the child and the pelvis It means also that the woman has been in labor long enough to have finished the first stage This at times means a serious injury to the balis, and unless the child be in a good condition we would not be justified in doing hebostectomy Neither should the woman be infected In making our diagnosis of the condition of the child, it should usually be made by auscultation and not, as one of the speakers has mentioned, by palpation of the cord, which, I think, in the majority of the cases, would be an impossibility

I also want to add that I believe there is still a field for eraniotomy, and it is in such cases where publications seems out of the question, even though the child be alive

INTRAUTERINE PRACTURE OF LFG

DR OTTO H. ROHRLACK: In this case there was evidence of a history of syphilis in the parents. The mother, 30 years of age, had given birth to two children They are now six and eight years

of age respectively and in perfect health. There was no history of trauma of any kind in this pregnancy. The foctus was easily outlined in the last two neeks of the pregnancy. It was rather superficial, and there seemed to be but little liquor aninii present. When the bag of waters ruptured, little fluid escaped and little escaped during the birth The examination of the membranes and placenta showed them to be normalno bands or threads. The baby weighed nine nounds ten ounces. It was normal in every way. except that the lower part of the right tibia was bent at right angles and immediately above this was a discontinuity of the skin which looked like a scar resulting from a healed compound fracture. The external malleolus was absent. the fibula could not be felt, and there was an absence of the outer two toes. The leg was shorter than the other. The Rontgen picture shows an angular deformity of the tibia and entire alsence of the fibula and the metatarsal bones of the outer two toes. There was no evidence of syphilis or rickets in the child, nor history of trauma in the mother

CIPHALOCILI IN A CASE OF HIMICRANIA WITH THE PRESINCE OF MOST OF THE SCALP AND THE MEMBRANOUS COVERING OF THE EN-CEPHALON, CONTLICATED WITH MESORIHOS SCHIELE, PALATOSCHIESTS AND SANDACTIVE.

DR CHARLES S BACON. The child was born spontaneously after a labor listing thirty-five hours with a face presentation The mother was a primipara. At the appearance of the first eyet at the vulva, it was mistaken for the bar of waters, which had, however, previously runtured. The cyst was torn open by the attending physician and the contents escaped. The child cried and was able to swallow but unable to nurse because of the meso-chisis of the nose and palate. After twenty four hours the cyst which had been runtured became odoriferous. The child was removed to the hospital but an operation was not to be considered. The head was dressed and the child was occasionally given water to drink and morphin was administered hypodermically to quiet it It was given 18 grain and was quiet during the night. The following morning the interne gave it 1/2 grain and two hours afterward repeated the dose Some time afterward he gave still another 1/4 grain. The child slept quietly all night, and the next morning it was still alive. It died a few hours later. It was interesting to note the amount of morphin which the child endured.

A post-mortem examination was not permitted

The cranial vault was practically gone. The base of the skull was present up to the occipital protuberance and the orbit in front. The parietals and the upper part of the frontal and occipital bones were absent. The scalp covered the entire head except where the two tumors protruded. One tumor had a pedicle about the size of the child's neck, arising a little to the right of the median line and above the eye. This tumor was not runtured. Skin covered about one fourth of it; the remainder was covered by membrane. The pedicle of the other tumor was about one to one and a half inches in diameter. It arose to the left of the median line, probably in the region of the posterior end of the parietal bone. There was also a fissure between the nostrils, and these were closed. There was a slight cleft palate. Both hands, especially the right, were simply clubs: the fingers were not senerated

DISCUSSION

Ds. CAME (for Dr. E. G. Beck): I wish to report the case of a child born with a large cephalocele two thirds the size of the child behal. Labor was normal and rapid There were no other defects. On the eighth day Dr. Beck operated without anasthesia, removing the tumor, which was divided into two parts by amerbrane. The membranes surrounding the tumor were ligated and the sac cut off, after pushing back into the cranium, the brain matter which was found in the tumor. The child made an uneventful recovery from the operation.

Six weeks after the operation signs of hydrocephalus appeared. The child showed signs of distress, regurgitated food, cried much, was cyanotic, had intervals of rapid hreathing and a crowing inspiration. Death occurred about three months after the operation. Withdrawal of a few cubic centimeters of fluid from the hydro-

cephalus gave temporary relief only.

Dr. Arthur Curis: The question of feetal deformities is an interesting one. Mall has

studied it more thoroughly than anyone else, comprising in his study some six or seven hundred cases. He is of the opinion that amniotic adhesions do not play much of a rôle in the formation of abnormalities of any kind. He believes that there are degenerative processes in the chorion which can he demonstrated macroscopically and microscopically. It is possible that there is some sort of inflammatory process which causes the degenerative changes in the chorion or which may affect the cells of the foctus as it begins to develop and this causes malformation by retarding the growth of the embryo. Failure of development of both arms and both legs makes it difficult to explain the pathologic findings, and yet these occurrences are compatible with the theory of inflammation or toxemia during the early development of the foctus. The cells which form the upper extremity proliferate most rapidly, therefore are most subject to any irritating process and are destroyed, whereas the other cells go on to full development,

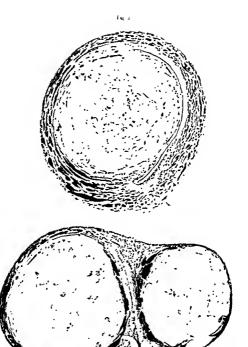
Dr. Gro. Scinatures: Surgeons have given up the idea of closing these encephaloceles and meningoceles. They drain and the results recorded in the literature are especially good when the sack in the spina blids was drained into the peritoneal cavity. If you close up the opening you do not remove the cause, the secretion of fluid continues and a hydrocephalus is the consequence.

The pulse twenty-five minutes before death was 80.

PREGNANCY WITH UNRUPTURED HYMEN

DR. FRANK LYNCH: The woman complained of amenorthee, and the husband stated that intercourse was impossible. Vaginal examination was impossible because of the severe gain. Under gas anæsthesia. I found a deep introitus, and on passing the index inger into the thymat ruptured, bleeding considerably. The uterus contained a foctus.





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EXPERIENCES IN SPINAL SURGERY¹

DUSTRUATIONS EPON 60 LAMINICTOMIES FOR SPINAL DISEASE

BY CHARLES A ELSBERG M D. NEW YORK CITY

AIL following observations were made upon 70 con-ecutive operations for spinal disease There were 60 primary laminectomics and rosecondary operations. Laminectomy was performed 22 times for tumor, o times for section of posterior roots for pain or spasticity, a times for inflammatory bone disease, 5 times for old fracture of the spine, twice for syringo- and hydromyelia, once for intramedullary cost once for an arteriovenous ancurs on of the nosterior spinal vessels, and a times for a neculiar disease of the roots of the cauda equina In ta natients not enough was found to explain the symptom-2

In the future, when sufficient time has clapsed, I shall report on the final results in the entire series of patients. As the improve ment in most of the patients is of necessity slow and gradual, years must pass before any definite statements of the end results can be made. In this place I desire to lay emphasis on the fact that the mortality of the operation of laminectomy should be a small one I have recently operated upon the fortieth successive

edge of the anatomy and physiology of the spinal cord, and of the exact course and relations of the conducting tracts, the recent advances in this field have been many and important We may confidently expect that much will be added to our knowledge in the near future as a result of clinical and exterimental research. In not a few instances, we are already able to diagnosticate the exact level of a spinal lesion and the tracts most affected, and not so rarely we can recognize in what direction the disease process is advancing and therefore say beforehand in what

tions compromised.

The greate number of these operators were performed by the NE was floored the Medical Conference of the State of the State

The surgeon who desires to have the best results in his spinal operations must have a good working knowledge of spinal physiology and pathology, he must be able to determine for himself the level and relations of a spinal lesion, and should be able to recognize, as

succession other fibres will have their func-

laminectomy for spinal disease without fatali-

ty from the operation. In experienced hands,

a laminictomy is neither a particularly hazardous nor a trying operation, and at the

Neurological Institute we have come to look

upon a laminectomy in a patient in good

THE SPECIAL FIRED OF SPINAL SURGERY

Although there are many gaps in our knowl-

general condition as a fairly safe operation.

far as our present knowledge will permit, its nature. Then he will be able to construct in his own mind a picture of the condition of affairs in the spinal canal and theroughly to understand the manner in which the disease is interfering with the cord's functions. The spinal surgeon will surely be required, more and more often, to invade the tissues of the spinal cord testif, and to attack the cord on its anterior as well as on its posterior aspect. The operative procedures must be planned to meet the indications in each individual case.

SOME FEATURES OF THE TECHNIQUE OF

After some experience, the technique of the operation of laminectomy is seldom difficult The incision of the skin, the separation of the fascia and muscles from the bones, and the removal of the spinous processes and laminæ so as to lay the spinal canal wide open, is a purely mechanical part of the operation and should be accomplished with very little expenditure of time so that the strength of the patient is little taxed before the actual manipulations around the spinal cord are Osteoplastic flap operations are begun inadvisable and unnecessary, because they are more time consuming and more bloody and do not give as free access to all sides of the cord The operation of hemilaminectomy is appropriate, I think, for only very few cases, for the same reasons that I have just given A wide exposure of the spinal canal is usually necessary, both for the purpose of exploration and in order that there shall be as little handling of the cord as possible. The operator should consider that every time that he touches the cord he is doing harm, only then will he have the proper respect for the delicate spinal tissues

In its technical aspects, spinal surgery has a great advantage over cranial surgery. No matter how skillful and expeditions the operator, the exposure of a part of the brain so of necessity a time-consuming procedure, and the patient's resisting powers are often sorely taxed by the time the dura is exposed For this reason operations upon the brain are often done in two states. In spinal surgery,

on the other hand, the mechanical part of the operation can be accomplished very rapidly if the surgeon has some experience and has provided himself with the proper instrument acrium. Two-stage operations are sometimes necessary when the laminectomy is done high up in the cervical region, and when a tumor is to be removed from the interior of the cord by the method of extrusion.

For ordinary purposes, at least two or three spunes and famina have to be removed, but I have often had to remore as many as five to seven before the entire lesion was exposed. The support of the spinal column depends mainly upon the bodies of the vertebre, and the functions of the spine are well preserved even after seven spinous processes and lamine have been removed.

The dura mater should always be tightly closed after the completion of a spinal operation (excepting in the cases to which reference will be made later) and the muscles, fascia, and skin very carefully closed by interrupted suture. The careful layer suture of the paravertebral muscles will contribute much to the perfect recovery of the mobility of the spinal column after a laminetomy.

Ossing from the muscles should always be carefully controlled before the dura is indised. The pia-arachnoid can usually be opened separately, so that even if there is a little blood within the dural sac it will not come into direct contact with the cord; and hence those paresthesis and root pains can be prevented which sometimes follow spinal operations and are due to bleeding into the subarachnoid stace.

A laminestation wound should never be drained, the carrell closure of the dura, muscles, fascta, and skin will be the surest preventative of cerebrospinal fluid leakage and the greatest safeguard against menloged infection. Even when the dura is left open, leakage of cerebrospinal fluid should practically never occur if muscles, fascia, and skin bave here neel satured.

When the laminectomy has been done in the cervical region, it is advisable to immobilize the cervical and upper dorsal spine by means of a large posterior splint, but in the dorsal and lumbar regions, no immobilization of the spine is necessary. The patients should be kept that on the hack for the first few days, and they usually prefer that position as the most comfortable. When the lam incectomy has been done in the lowermost dorsal or lumbar and sacral regions, great care should be taken that the dressings are applied so as to guard against softing of the wound with urine or frees. This is of course very important, for so many of the pittents who require a spinal operation in one of these regions are, from the nature of their dressinor or or less incominent of turns, and taxes

THE SIGNIFICANCE OF A POSITIVE WASSELS
WASSELSTON IN PATIFICAL WHILE
SYMPTOMS OF SPINAL TRANSPORT

The great value and importance of the Wasermann reaction is universally recognized but I am not at all certain that its importance in patients who have a surgical spin il lesion has not been somewhat overestimated times gone by, a previous syphilitic intection was excluded by means of a thorough course of mercury and iodides even if no lustory of a specific injection could be obtained means of the serum reaction many patients are saved from an unnecessary and u-cle-s course of treatment But what paration shall we take in the case of a patient with the s) mptoms of a spinal tuntor who gives no history of a syphilitic infection, and in whom the Wassermann reaction in the blood or cerebro-pinal fluid, or in both is positive? How long is it fair to delay surgical inter ference? If the symptoms do not recede or continue to progress alter on intravenous injection of salvarsan, is further delay justs fied? I believe that it is almost as great an error to allow a patient with a suspected spinal tumor - even if it be a gumma - to become totally paraplegic while antisyphilitic remedies are being given as to allow a patient with a possibly syphilitic brain tumor to become blind while internal measures are being tried. There is no reason why a patient with a positive Wassermann reaction in the blood and cerebrospinal fluid may not also have a spinal tumor. I have twice removed an extramedullary glioma from the cord of patients whose Wassermann reaction was

positive. Horsky states that it is his belief that a gemma that is of sufficient size to give marked symptoms of brain or spinal tumor should be operated upon. As far as gumma of the spinal cord is concerned, I agree with Horsky's radical view, with the one proviso that an intravenous injection of salvarsan has not caused a marked and rapid improsement Irreparable injury to the cord may be done by a gummatous growth before it has yielded to antisyphilitic remedies.

FRENCE THAT MAN OF CLE IN THE DIAGNOSIS
OF THE TIATE OF THE TISTON SLATE
ARRESTS LARLY SAMPTOMS

The correct diagnosis of the level of the lesion can be made in most instances if careful and repeated examinations have been made and the disease will be exposed by the operator if he has removed the correct spinous processes and famine.

I desire to call special attention, however, to what may be called the late symptoms of spinal disease which may be likened to the late symptoms of intractanial disease. As in the case of brain disease, these late symptoms may overshadow the true localizing symptoms. Therefore it is important to obtain a careful history of the early symptoms and the order of their appearance.

If there has been, for a long period of time, a stasts of cerebrospinal fluid above the level of a spinal tumor, motor and sensory symptoms may occur which are due entirely to the pressure of the fluid. In the beginning, these symptoms are irritative, later they are true pressure symptoms. They may give level symptoms far above the real level. The following patients had an extramedulary glioma at the level of the eighth dorsal segment, which was successfully removed, but for many months she had motor and sensory symptoms which pointed to a lesion at the level of the third dorsal segment.

EXTRAMEDULLARY CLIOMA OF THE EIGHTH DORSAL SEGMENT; LAMINECTOMY; RE-MOYAL; RECOVERY

Mrs. H. S., 57 years of age, admitted to the Montefore Home on the service of Dr. I. Strauss on November 17, torr Patient is married and hes nine healthy hung children; never had any



Fig t Appearance of back four weeks after laminectomy.

micratrage III since articen months, beginning with numbers and lighing resistations in the soles of the feet, extending up to hips, painful example need to the feet, extending up to hips, painful example need to the feet of the feet

increasing weakness Lamination showed complete spastic paraplegia in the lower extremities, with exaggerated reflerer, chains and flabrinski. Complete loss of all sensitions up to the lower of the righth describ area to the complete of the right and the complete of the

level of D3.
February, 1912. Level of sensory disturbances at third dorsal. Drignosis at this time, intradural obstruction at level of third dorsal segment. Operation advised at this level, but delayed because of positive Wassermann.

May Spasticity of the lower limbs much worse; very marked disturbances of sensation in ulnur distribution in both upper extremities

June 14. Laminectomy at level of the eighth dorsal segment, on account of most marked symptoms at this level (Dr. Eisberg). Spines and laminæ of seventh, eighth and muth dorsal vertebraremoved in the usual manner, incision of dura at level of eighth dorsal, to the right and behind cord.



Fig 2 Patient M G Appearance of back four weeks after laminectomy nith removal of air spines and laming

a small tumor, 2x1 cm in size, easily removed Suture of dura, muscles, fascia, skin, in the usual manner. Duration of the operation, 35 minutes, uncomplicated retorery

REMARKS

This case is of very great interest. For a number of months there was a well marked mostor level at a well marked mostor level at the third dorsal segment. If an operation had been performed during this period (about four months) there would have been every justification for a diagnosis, of a lesion at that level and for an opening in the same place—five segments above the true seat of the tunor. The operation was done so low down because it was thought that the high signs were probably due to fluid above the site of the tumor. It is of interest also that the patient had a positive Wass-cruman reaction, and that the tumor that was removed was a to roical glioma.



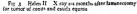




Fig 4 X ray six months after laminectomy for intradural cumor of spinal cord

Secondary degenerations in the cord may, in rare instances, cause a shifting upwards of the level of the sensory and motor symptoms. I have operated upon one patient in whom this error had been made, and the tumor was at first sought too high up.

ON THE SUPPOSED DANGER FROM THE SUDDEN ESCAPE OF CEREBROSPINAL FLUID WHEN THE DURA IS OPENED

It is well known that the sudden removal of a large quantity of cerebrospinal fluid by lumbar puncture is often followed by severe general symptoms, such as headache, voniting, syncope, and sometimes collapse Most writers speak of the danger of sudden collapse of the patient during an oneration, when there is a sudden escape of a large amount of cerebrospinal fluid Our experience is entirely against the view that dangerous symptoms result from this escape of fluid In over 70 spinal operations, I have never seen symptoms which could fairly be ascribed to the escape of the cerebrospinal fluid when the dura was On theoretical grounds, such an incised occurrence would be surprising. As has been shown by Grashey, Kronig, Propping, and others, the pressure of the spinal fluid in the lumbar region, when the patient is in the horizontal position, is almost zero under normal conditions When there is pressure on the cord, this pressure may be raised; but it surely can never equal the atmospheric pressure When the dura is opened, a pres-

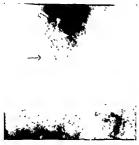


Fig 5 Pierre II Compression of cord after old fracture. Dislocation of spine in certical region. The A ray plate shows the marked deformation of the spinal cord.

sure of sytteen pounds to the square inche replaces the intradural pressure. It seems to me that it is much more probable that the symptoms which have often been observed were due to prolonged manipulations which had gone before and to the handling of the cord itself. On no other hashs can I explain the entire absence in our series. We are accustomed, however to lower the end of the table as soon as the fluid beguns to escape if it he in large amount

THE OCCURRENCE OF BLADDER DISTURBANCES AFTER LAMINICIOUS — ABDOMINAL DIS

TINTION AFTER LAWINI CTOWN IN THE DORSAL REGION

Even if no disturbances of the bladder existed before the operation, they are very likely to occur afterwards. Usually, there is retention of urine for a few days, rarely, this persists for several weeks. When the laminectomy has been done in the lumbosacral region, the retention is accompanied by a lack of feeling of bladder distention, after an operation in the dorsal or cervical region, the patient will know when his bladder is distended. When the natient regains the contended when the patient regains the contended.

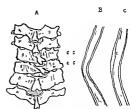


Fig. 6. Perre If. (3) Outline of cervical vertilers, showing rotation of fifth and sixth cervical vertilers (6) Angulation of cord found at operation. (a) Relief of angulations (c) out found at operation. (b) Relief of the fourth of the fou

trol of his bladder, he is at first, able to empty the bladder only partly, and it often requires several days before the bladder can

be entirely emptied

Unless incontinence existed before the
laminectomy it should rarely occur after-

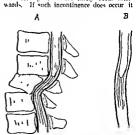


Fig. 1. Lawra L. Old fracture of spine, marked improvement after faminectomy. [4] shows the appearance of the spine with pressure on the cord and cauda equinat, [6] shows how the corous and cauda were allowed to straighten out after the fire removal of spinous processes and lamone. (Divisements)



Fig 8 Mary G Ohl fracture of spine with marked deformation

usually means that some injury has been condone to the cord or that there has been considerable bleeding within the sac of the piaarachnoid. If the incontinence is due to the latter cause, it will usually disappear within a few days or weeks, if due to the former, it may persist for months, and if the injury to the cord has caused a more or less complete transverse lesion, it may be permanent.

Retention of urine calls for regular catheterizations three or four times in twenty-fourhours and care should be taken that the bladder never becomes overdistended Over distention is very apt to favor cystitis. Urotropin 1s to be given after every spinal operation for several weeks, and its use must be continued longer if the patient has to be

After the removal of a tumor or other disease of the cauda equina which has caused retention of urine as one of the symptoms, the retention of urine may persist for a number of months. In these patients, one can often stimulate the bladder to empty itself by

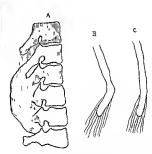


Fig. 6 Mary G. Compression of cord from old fractive of spine, marked improvement after laminectomy. (a) shows the marked mass of bone which bound together the spines and caused narrowing of the spinal canal and angulation of the cord. (b) shows the angulation of the rord found at operation (a) shows the appearance of the cord after the removal of the bony masses. (Diagrammatic.)

suddenly removing the catheter during catheterization, at the same time that the patient is told to attempt to void his urine with the catheter in place.

Abdominal distention may occur after a laminectomy, as after any other operation But it occurs very frequently after a laminectomy in the lower dorsal region (Do to D12) After a spinal operation at this level, a very marked and, to the patient, very distressing abdominal distention often occurs, which can be only partly relieved by cathartics or enemata, and which usually persists for several days The nationts are unable to pass any gas, the abdomen is enormously distended, and vomiting sometimes occurs, so that to one who has not seen the condition. the patient seems to present the clinical picture of acute intestinal obstruction. I have seen this condition a number of times. and it has regularly subsided in the course of a few days. The best treatment, in addition to enemata, seems to be small repeated doses of morphin and atropin.



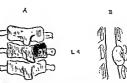
Fig. 10 Mrs. J. S. C. Old fracture of lamina of the fourth lumbar vertebra.

THE APPLARANCE OF THE SPINI AND THE FUNCTIONS OF THE SPINAL COLUMN AF-TER COMPLETE LAMINECTOMY

From the resilients, standpoint, the appearance of the back of a patient upon whom a complete laminectum; has been done leaves nothing to be desired (Fig. 1 and 2). Excepting for the linear cuntriv, the contour of the back appears almost normal. Sometimes the spinous, processes above and below the operative area are somewhat prominent, when this is noticed at the time of the operation, one can rongeur away a small piece of the spines, just above and below the region exposed, before the fascia and skin are closed by suture.

The amount of bone that must usually be removed in the operation of laminectomy is shown in the accompanying X-ray pictures (Figs. 3 and 4). The sear tissue that is formed between the divided laminer and the skin is exceedingly dense and hard and forms an excellent protection for the cord beneath In this sear tissue there are often areas of bone formation, and occasionally an entirely new vertical arch is formed.

The free mobility of the spinal column is usually fully recovered. For a number of days after the operation, movement of the head, trunk, or extremities will cause pain in



Ing. 1 Mrs. J.S.C. Appearance of fractured lumina at operation, (5) shows the torn and rolled up ligamentum flasum which compressed the fourth lumbar root. Lamin nectomy and removal of the torn ligament was followed by complete telef.

the part of the spine that has been operated upon. As soon as this pain disappears the patients are able to turn freely, and within ten to fourteen days they are able to sit up and begin to walk.

For a few month after the laminectomy three is often considerable local stiffness and rigidity of the spines, especially when the patient attempts to bend forward or backward Lateral mobility is generally well preserved. In some cases, however, the patient is able to move his spine freely in all directions a few weeks after the laminectons.

Rigidity of the spine is much more apt to be prolonged after laminectomy in the lower dorsal and lumbar regions, and considerable massage and exercises are sometimes necessary before the entire vertebral column regains its normal mobility In the cervical and upper dor-al regions, the patients very quickly regain the power of free movement of the head in all directions Some of these patients have a tendency to carry the head somewhat forward, as if there had remained some weakness of the spinal muscles in the cervical region This muscular weakness soon disappears Six months or a year after a jaminectomy has been done, the vertebral column will be found to be as freely movable as the normal, or as it would have been in the individual case if no operation had been

performed

THE SURGICAL FEATURES OF OLD FRACTURE OF THE SPINE

The results that have followed operative interference for recent fracture of the spine with signs of serious injury to the cord have been very poor. Either the patients have not been relieved, or the fatal outcome has been hastened, or the patients were improved after the operation In this latter class of cases it has usually been an open question whether the same improvement would not have occurred if no surgical interference had been attempted The worst results have followed operative interference for fresh fracture of the cervical spine. In appropriate cases an operation might be performed where the X-ray showed clearly that there was a pressure of bone threatening complete destruction of the spinal cord. Here the surgeon might attempt to relieve a destructive cedema or hamorrhage into the cord, by means of incision of the cord, as suggested by the animal experiments of Allen In general, however, the surgeon should be very conservative in his recommendation of operative interference Where the X-ray shows undoubted bone pressure and there is consider able motor power left, an operation may be advised It has been my experience, however, that it is best to delay surgical interference even in these patients

There is a class of cases in which the symptoms of the cord lesion are not very marked for weeks or months after the injury, but sooner or later signs of serious and progressing interference with the cord functions appear. In other patients, the signs of a serious cord injury have cleared up to a certain extent, and then improvement has ceased In both of these classes the X-ray shows that there is, due to the original injury or to new bone formation, marked narrowing of the spinal canal and, therefore pressure on the cord, or a partial dislocation of the body or laminæ of one or several vertebræ, causing marked angulation of the cord These patients can be enormously benefited by a laminectomy, with free removal of spinous processes and lamina and exploratory opening of the dura. By this means a much narrowed spinal canal can be widened and a marked

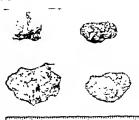
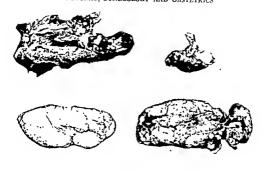


Fig 12 Examples of extramedullary spinal tumors successfully removed at operation

angulation of the cord straightened out by allowing room for the dural sac to bulge backwards In some of these cases, the prominence on the posterior surface of the body of a vertebra can be removed extradurally. The accompanying X-ray pictures and sketches (Figs 5 to 11) show the conditions that are met with and the changes that are brought about by the decompressive laminectomy. Sometimes it is sufficient to remove the spinous processes and laming of the affected vertebræ so as to allow the cord in its dural sheath to bulge backward, but in most cases the dura should be incised and the cord A localized cyst or a hamatomyelia cavity may be found and laid open. If necessary, the dural sac should be carefully raised up and a prominence on the posterior aspect of a vertebral body removed. When this is done, there is often considerable venous oozing from the plexuses on the posterior surface of the vertebral body. The bleeding can be controlled by pressure with gauze packings The results in these patients are very satisfactory. Improvement usually begins soon after the operation, as the following short histories will show:

CASE 1 Compression of cord after old fracture dislocation of spine, luminectomy, steady improve-



I ig 13. I xamples of intramedullary spinal tumors removed from the interior of the cord by the method of extrusion. These tumors appear very large on account of the referma which occurs during the retrusion.)

ment (Fig. 5 and 6) Pietre II, 27 years of age a private patient of Dr Peterson at the Neurological Institute Pell down elevator shaft five months before, unconscious for several days. Paralysis of right arm and leg and weakness of left safe. After several weeks some return of power in night leg but mareasing weakness of left arm and contractures in right upper extremity.

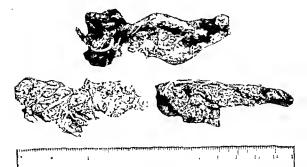
Physical examination — Palpation of spine shows irregularity of fifth and sath errival spines Marked alrophy of muscles of right upper extrems; we exclude a spine spatial partial production of many spines and set of left one. Abdominal reflects aboven, the can disable feris exaggerated, right more than left, double ankle clomes and Balantska Dminustand on right side. Next, shows that there is an old understand the state exercise the side of the fifth and sixth exercised to the fifth and sixth exercised virtebre.

and sixth cervical vertebrar February 8th — Lammectomy (Dr. Elsberg), removal of spines and laminar of lourth, fifth and sixth cervical vertebrar, dura much thekened; necision of dura followed by escare of large amount of ceethosquard flund under pressure, cord much flattened and but at a makel, angle by promuter on posteror surface of body of fifth cervical vertibea. After removal of spinus and futurity, cord indiges lacekantd and angulation is straightened out. Sotter of dura, muvele, fascia, and skin in usual manner. Duration of operation, 43 minutes, considerate, under the first production of the pro-

lebruary 12th -- Abdominal reflexes have returned, slight return of sensation in left foot

May 1st — There has been constant and progressue improvement in both power and sensation, washess of left arm and leg have disappeared, marked increase of power in left upper and lower extremity, patient walks about freely, great improvement in sensory disturbances

Result Very marked and steady improvement CASE 2 Old farative of spine usil competersion of cond, laminectonay (Dio. 11, 12, Li), Great improvement (Fig. 7) Laura L. 36, admitted December 36, 1911, to the service of Dr. Collins at the New York Neurological Institute. Fell from wagon 19 months ago and was in bed one week. Plans to back, pain and stiffness in left hip, followed



laigen, kondan kalanda akin kalanda balatah tahus laisi kada tahatah tahun

Fig. 14 Large tumors of the cauda equina removed by laminectomy

a ten months later by neakness in left and then in right lower extremity. Now complains of cramps in both lower extremities and of neakness in both lower limbs especially the left.

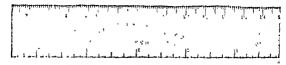
Patient is able to walk only by means of crutches She has a large supporting spinior on the left lower himb Upper extremities are normal, both lower extremities very weak—the left so weak that the foot can hardly be raised from the bed, double drop foot

There is hypasthesia and hypalgesia over the hurd, fourth and fifth sacral areas on both sides, band of hyperesthesia and hyperalgesia two inches wide over the right and left distribution of L2 and L3 Stiffness of back in Dover disrast and lumbar regions, tenderness of twelfth dorsal and first fumbar spines. X-ray shows old fracture

December 18th — Lanuncetomy (Dr. Elsberg) No irregularity of spine can be lelt belore operation Spines and lamine of tenth, eleventh and twelfth dorsal and first lumbar vertebra removed, spine of twelfth dorsal has been fractured and points beliquely to the left. The dural sax has heen obligated to the left of the dural sax has heen the left of the left of the dural say has been body of the first lumbar vertebra. When the dural so opened, the roots of the cauda cauma are found much datened and tightly stretched at an angle over a promuner of the posterior surface of the body of the first lumbar vertebra. There is a marked deformation of the spinal canal (Fig. 7). The attempt to remove the prominence of the body of the first lumbar had to be desisted from because of the profuse hierding that ensued when the duta see was russed and the body of the vertebra exposed of the removal of the spines and lammar had allowed the removal of the spines and lammar had allowed the troots of the cauda equina to bulge back-nation, so that the marked angulation had disappeared Suturer of dura museles and s.in.

Convalencence from the operation uncentrifical gradual improvement in all of the symptoms. By the beginning of January, the patient was able to stand alone without her splint, one month later she was walking around freely with the and of one cane. The band of hypercastless had disappeared, and the perincal sensory loss was much less marked Two mouths later, the patient was walking around without any support, she walked up and down stars without trouble and was able to attend to her housework. The drop foot on the right such had disappeared, here was only sight weakness of the left side, power in the right lower extremity was normal, of left, was much improved. Can raise normal, of left, was much improved.





lig to Acre lirge sum e of the compound cauda equina removed successfully at operation

hoth feet from bed with case. Ince and ankle jetks stiff absent. The patient returned to her home in the South and has not been heard from since.

CASE 3. Compression from cord of old fracture 15 years before languactomy, view marked tempore ment. Mary 6, 36 vers of age extract of Dr. Bailes at the Neurological Institute (Figs. 8 and 9). (Reported by Dr. Bailes at the meeting of the Miretan Neurological Vesociation 1987).

At the age of 18 fell from back of mule, straing on her back. I key for some stiffness of the back, she was not appriently hurt and shal not go to feel. Three days I ktr. a prominence was noticed in the middle of her brick, but excepting for the fact that the back was somewhit stiff she had no symptoms vary severe ashing pains in both of her lees, and had to go to be for account of the pun

Physical renumenton — Marked we haves of both legs — cannot rase the kit from the bed, the right only about sy unles. All the muscles of both legs are atrophic, the left more than the night, knee jecks about, jerks present double chous and Balunski. There is a marked deformity of the lumbar spine, a very pruminent gibbus from twelfth dorsal to the fourth lumbar, most marked at the second lumbar spare. There is a complete loss of all three ensatuons out the third fourth and fifth lumbar and first secral areas on both sudes, and on marked dimmuton of all ensations over the search and third secral area. X ray shows a destruction of the lower surface of the body of the first lumbar and upper sourfee of the body of the first lumbar and vertebra and some destruction of the bods of the second and thail lumbar vertebra, and a large that the second source of the body between the second sources.

January 38 1011 — Laminectomy (DF Esberg). Spinose processes of third and fourth fundar, and then successively of the second first lumbar and then successively of the second first lumbar and the first second the second first lumbar and needs to be second for the second second to see the second form of the target amount of the first second form of the second first second form of the second first secretary in second second secretary and the second first secretary second form secretary and second first secretary second second second first second first secretary second second second second second second second first second first secretary second sec

had a shaggy appearance. Most of the new-formed bone was removed. Suture of the dura, muscles, fascia, and skin in the usual manner. Convalescence uneventful; marked and rapid

improvement.

March 7th.— Can raise both limbs freely from bed; can stand unsupported and can walk with some assistance; pain in thighs much less; almost all of the sensory disturbances have disappeared, and it is difficult to find any area in which there is any definite diminution in sentability

April 21st.—Discharged, relieved; all sensory disturbances have disappeared; back is still rigid; patient says that pain in thighs is much less. She now has good power in both limbs, and walk around without assistance; ankle closus and Babinski have disappeared; knee Jerks present on both sides. Still has some pain around the left

Case. A Compression of fourth lumbur root by from ligamentum subfasum and fractured laming of faurth lumbur vectors. Laminectomy, removal faurth lumbur vectors. Laminectomy, removal ligament; complete relief [Figs. to and 11). Mrs. J. S. C., a patient of Dr. M. Allen Starr, 40 years of age. Throw out of an automobile ten months ago, stiffness of back since that time Sur weeks ago, pain over the distribution of the fourth lumbur root on the left side, rapidly growing very seven. X-ray shows old fracture and thickening of arches

of fourth and fifth lumbar vertebræ Laminectomy June 25, 1912 (Dr. Elsberg). Removal of spines and laming of third, fourth, and fifth lumbar vertebre Lamina of fourth is dorsally dislocated on the left side, the arch of the fourth vertebra having evidently been fractured and carned to the left. As soon as the left lamina of the fourth lumbar vertebra was removed, a firm mass hulged out of the spinal canal. The mass was about 2 cm. thick, and the manner in which it was forced out showed that it must have been under considerable pressure in the canal. The mass was excised and proved to be a much thickened ligamentum subflavum, which had evidently been tora loose at the time of the accident, ten months before. Part of the fourth lumbar root on the left side was then divided. Suture of muscles, fascia, and skin in usual manner. Duration of operation 30 minutes Convalescence uneventful Patient out of bed in

Convalescence uneventful Patient out of bed in two weeks, relieved of all of her pain Complete recovery

REMARKS

These four cases are given in some detail in order to show how very satisfactory are the results that can be obtained in these patients. The relief of the pain is often inmediate, and improvement in sensory and motor symptoms very rapid. Fracture of a spinous process or lamina occurs much more often than we believe, and all the symptoms that the patient may have at the time of the injury may be a

little pain and stiffness in the back. Only later, when the pressure on the cord gives rise to symptoms, does the real nature of the injury become clear. I believe that if all of the patients who are treated for a sprain or wrench of the back were subjected to an X-ray examination, an injury to the bony framework of the spine would be often discovered. It is remarkable, also, how often a serious, injury to one or more vertebral

bodies will give few symptoms. I have operated upon several patients from whom no history of an injury to the back could be obtained, but in whom the X-ray findings and the operation demonstrated that there must have been, at some time or other, an injury to the spinal column. While in some of these patients the improvement occurs very quickly, in others it is very slow, and months or years will pass before most of the symptoms have disappeared. If the knee and ankle jerks are absent, it may take many months before they again appear. When there has been much new bone formation, the laming of the affected vertebre should always be removed very freely, so that the intervertebral foraming are exposed. If this is not done, disagreeable root pains may persist, Often it is advisable to cut the most affected posterior root. The operator must always be certain that he has removed a sufficient number of vertebral arches so that the cord and its membranes can bulge backwards and any angulation be entirely relieved.

THE SURGICAL ASPECTS OF SPINAL DECOM-

In the paper by Dr. Bailey and the writer! we have called attention to the remarkable effects that sometimes follow a laminectomy for symptoms of local spinal disease where nothing abnormal is found inside or outside of the dura, and where there is no increase of pressure. In that paper we suggested that the benefits that seem to accrue might be due to changes in the spinal circulation or might result from the entrance of air into the spinal canal. Since that paper was published, I have operated upon several additional

* Prance Balley and C. A. Eliberg, Spinal Decompression, J. Am. M. Am., March 9 1912, vol. 38

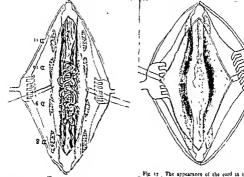


Fig 16. Attenovenous aneurysm of the posterior spinal vessels, giving the symptoms of a spinal tumor

patients and have seen great relief from the symptoms, so that our conclusion is justified, that the opening of the spinal canal may, and often does, have a profound effect upon the spinal cond. This may act beneficially upon some spinal diseases whose nature is as yet not understood and whose pathology is unknown. I have recently operated upon a patient with a spinal disease, who had been incontinent for a number of months. Nothing was found at the operation to explain her symptoms, but she recovered control of her bladder within a short time of the operation

There is a peculiar disease of the roots of the cauda equina which has not, as far as I have been able to determine, been described. The symptoms which the patients present are very like those of tumor of the cauda equina Although nothing is found at the operation that can be relieved by surgical means, all of the patients improved very much after the operation, and the result can only beascribed to the laminetcomy. These cases will soon

Fig. 17 The appearance of the cord in the case of Dr. L. with an intramedullary tumor of the cervical cord, be described in detail by Dr. Kennedy and the writer

INTRAMEDULLARY AND EXTRAMEDULLARY

SEVAL TUNDES AND THEIR REMOVAL.

In my series of twenty-two cases of spinal
tumor, four were extradural and eighteen
intradural. Of the latter, eight were cervicial,
five dorsal, two lumbar, and seven affected
the conus and roots of the cauda equina. Of
the intradural tumors, five were intramedullary and thirteen extramedullary. (Figs. 12
to 21)

The removal of an extramedullary tumor of the spinal cord is one of the most satisfactory of all operations. If the tumor has been correctly localized and the proper spines and laminas have been removed, the operation can usually be done in half an hour, or less, and the dangers of the operation are very small. It is always advisable to remove at least two or three spines and laminar, so that the tumor is well exposed. The operation can usually be done in one stage, excepting when the growth is in the upper or middle cervical

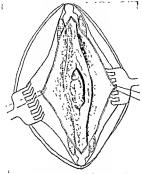


Fig. 18 Beginning extrusion of the tumor in the case of Dr. L., after incision of the posterior column of the cord over the prominence of the growth.

region In these latter cases, it is often preferable to stop as soon as the tumor has been exposed, so as to allow a readjustment of pressure conditions on account of the proximity of the medulla

The removal of giant tumors surrounding the roots of the cauda equina (Figs 14 and 15) can also be made more easy and safe if the actual removal of the tumor is delayed for a few days or a week. These tumors surround the roots of the cauda, and it is often difficult to free the roots without the infliction of considerable injury to one or the other of the roots. If the dura is left open until the second stage, the tumor will be found to be partly extruded from the spinal canal and from the roots of the cauda.

Intramedullary tumors must always be removed in two stages, by the extrusion method, as described by Dr. Beer and myself. I have elsewhere written in detail regarding the principles of intramedullary surgery — procedures which I hope will must be surgery — procedures which I hope will must be surgery — be surgery —

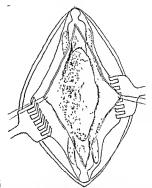
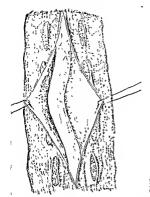
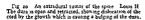


Fig 19 The completely extruded tumor in the case of Dr L. The tumor was removed with ease, and the page good a recovered to a very marked extent (Large save growth due to ordema, which occurs during extrusion.)

tions. I have shown that it is both feasible and safe to incise the cord in order to allow of the extrusion of localized intramedullary growths to empty cysts of the cord, and for intramedullary decompression in irremovable tumors, syringomyelia, etc. By the method of extrusion (Figs 17 to 19), the separation of a tumor from its bed or cavity in the cord is left to the processes of nature processes are based upon pressure conditions in the cord Nature can accomplish the end desired with far less danger of injury to the delicate structures of the cord than the most gentle manipulations of the operator. Therefore, the surgeon must leave to nature the actual extrusion of the growth, by the free removal of spinous processes and lamina and by a properly placed incision in the cord substance, he must make conditions as favorable for the extrusion of the tumor as possible. Finally, when the tumor has been extruded

"Elsherg and Beer Am J M Sciences November, 1911.





from its bed in the cord, he must remove the tumor without injury to the delicate struc-

tures which surround it When the tumor hes outside of the cord, either under the pia-arachnoid or under the dura, its removal is usually accomplished with ease. Many of the growths he on the posterolateral aspect of the cord, so that when the dura is incised and retracted the tumor is raised from the cord. If it lies under the pia-arachnoid, these membranes will have to be divided before the tumor can be extracted. If the tumor lies on the anterolateral aspect of the cord, one can usually expose it very satisfactorily by dividing one slip of the ligamentum denticulatum The ligament is then grasped with fine forceps and drawn backward until the growth has been removed If a tumor on the anterior surface of the cord is of small size, the division of one slip of the

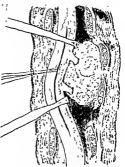


Fig 21 Louis H Dural sac retracted to show the tumor in its bed in the spinal canal. In this patient, the X-ray picture showed a marked enlargement of the canal at the level of the tumor, due to absorption of the hone

dentate ligament will allow the cord to be drawn out of the way and rotated sufficiently to permit of the removal of the growth. Sometimes, however, it is necessary to divide one posterior root before the tumor can be well exposed.

It is not advisable to make a careful examination of the cord after the tumor has been extracted, because these flattened cords are very soft and easily injured.

If a posterior root is found stretched over the tumor, especially if there have been severe root pains referred to that nerve before the operation, the root in question should be divided. Disagreeable root pains sometimes persist in a posterior root which has been long pressed unon by a tumor.

The dura must always be opened, even if an extradural tumor has been found, for there is sometimes an intradural growth as well. Palpation through the dura is an uncertain procedure, and a small intradural tumor on the anterior or anterolateral surface of the cord might easily be missed.

SUBCUTANEOUS RUPTURE OF THE DIAPHRAGM AND POSITIVE PRESSURE (MELTZER)¹

AN EXPERIMENTAL AND CLINICAL STUDY

By E. C. RIEBEL M D, CHICAGO

Instructor in Surgery, Northwestern University Medical School; Surgeon to People's Hospital, Associate Surgeon to Wesley Hospital

N September 8, 1910, the following case came under my observation. A boy about ten years of age was brought to People's Hospital with this history A wagon loaded with gasoline cans passed over his left leg and side of chest, almost cutting off his ear, while the boy was lying prone on the ground I saw him about two hours alter the accident. His facial expression was anxious; pulse 116, rapid, thready, and irregular He was sitting up in hed, unable to lie down Had vomited shortly after entering and vomited again after my arrival Muscular defense had been noted upon his arrival and was not well marked. The abdomen was distended in the epigastric region, the lower portion of the chest wall seemed broader than normal There was considerable tympany over the epigastrium; percussion over the chest eheited tympany as far as the level of the fourth rib No breath sounds were beard over the left chest The heart tones were very indistinct and the apex heat could not be located The breathing was jerky, as if due to fixation of the disphragm, the same as during a severe gall-stone attack. He complained of pain "shout the heart" The epigastrium was tender The liver dullness was almost obliterated Urine had been voided and was normal. There was no dullness in the flanks. The skin over the epi-gastrium felt somewhat emphysematous. The symptoms pointed strongly to a runture of the diaphragm and that of a hollow viscus The boy was etherized and an incision made in the median line from ensiform to navel The breathing became more regular after complete anæsthesia had begun When the perstoneum was reached, this bulged out as if under pressure Upon incision there was a hissing sound, some loops of distended small intes-tines slipped out of the wound. There was no blood or gastro-intestinal contents in the abdominal cavity. The transverse colon was in the place commonly occupied by the stomach With difficulty I located the pylorus and, following this, found almost the entire stomach in the pleural cavity The entire left half of the diaphragm, as far back as the costal angle, had been detached from the ribs at right angles to its fibres. The opening admitted four fingers widely spread Upon withdrawing the stomach from the chest cavity the boy's respiration became much embarrassed and very shallow. Direct heart massage was practiced through the tear. The left ventricle contracted vigorously for some time, but respiration ceased and could not be

re-established. Inspection revealed the stomach and intestines as well as parenchymatous organs uninjured. A post-mortem was not held.

A search of the literature shows that the number of reported cases is not great, while one rarely finds a case which recovered. The scarcity of published cases does not indicate that the occurrence of this condition is so rare, for a personal communication with a number of surgeons engaged in accident and emergency work revealed the fact that each one had one or more of these cases I wish to draw attention to the sharp difference between open and closed diaphragmatic wounds. The former are rarely associated with immediate prolapse of abdominal organs, excepting the omentum, because as a rule the opening is too small, operative interference is usually successful, while in the subcutaneous tears of the diaphragm, which are usually large, a prolapse is the rule, and the outcome, with or without operation, as mentioned above. Whatever the individual surgeon's opinion may be regarding the use of differential pressure in operative pneumothorax, whether necessary or not, I have the conviction that if it could have been employed in this case it might have gone to a happier termination. A number of experiments were undertaken, to study both the physiological side of subcutaneous rupture of the diaphragm, and to suture a diaphragmatic wound under differential pressure to ascertain its advantages, if any. The admirable simplicity of Meltzer's insufflation apparatus commended its use, hoping that in its original form it might be used in the human in a case of emergency without much trouble and expense.

The air supply was furnished by an electric pump, the air passing through a Wulff hottle one balf full of ether A manometer was placed in the circuit A soft rubher catheter, size 21, French,

1 Read before the Chicago Surgical Society, Rovember, rong (See discussion, p. 223)

served as tracheal catheter. The tip of the eatherer was cut off and the edges trimmed. At time I used a second Wulff bottled filled with cold water to moisten and coul the air before pressing through the other. A central test shoused that the appraarts the content of the pressure was concerned. The middle loke of the right lung was resected in one dog with good success, in another the sternum was removed in toto, exposing both pleural cavities. The dog was kept airly and airly and the carboving both pleural cavities. The dog was kept airly and the carboving both pleural cavities. The dog was kept airly and the carboving for external was discontinued for external countries of the continued for external countries.

The advantages of this method for ances thesia I merely emphasize in passing, as it has been used by Elsberg and others in many cases on the human subject, irre-pective of its pressure features

Nine dogs were used for the experiments, two of these for the study of the results of rupture of the disphragm only the remainder for suture of the lesions produced The incisions in the diaphragm were made uniformly on the left side in the muscular portion of the diaphragm at right angles to the course of the tibres and large enough to admit three fingers. In one dog (No 7) an abdominal opening was made and the diaphragm incised. Insufficion which had been employed up to that time, was dis continued after the hamorrhage had been stopped There was a prolapse of abdominal viscera most immediately respiration ceased blood pressure (Riva Rocci) lell to zero and insufflation had to be recommenced. This proved successful blood pres sure rose to 70 mm , the dog honesee died after a few minutes. Both lungs were pink and showed no signs of cidema. The right ventricle was detended In another slog (No 8) the chest was opened by a quadrilateral ilap without insuffation, respiration became quite shallow and finally ceased. The heart continued to beat for a while then stopped. At this time insuffiction was instituted and the dog revised. The displiringm was incised, the stomach allowed to prolapse into the pleural cavity, and the flap closed by two layers of autures Blood pressure ranged from 75 mm to zero before insuffation. afterwards at the close of the operation, from of to oo mm The dog recovered from the anxithetic completely, but died somewhar suddenly one hour In the other seven dogs used for suture experiments, insuffiction was used throughout After incision of the desphragm the proximal portion of the muscle was pushed over to the right side and the blood pressure taken before, during, and after the experiment No appreciable changes were noted in the blood pressure The manfflation pressure ranged from ro to 25 mm during the suture of the displiragm and was recreased to 35 mm while closing the wound to drive out all the air Respiratory movements were almost absent,

and this state of comparative apnea greatly facilitated the suturing, as the diaphraem hardly moved It was possible to introduce a continued suture, closing the rent in the diaphragm completely. In those dogs where the tear was produced through the abdomen I placed it dorsally, and found the mobilization of the diaphragm, by resection of the ninth no at the junction with its cartilage and resection of the tenth rib in the axillary line (Lannelongue Willy Meyer), quite advantageous to bring the diaphraem into a position of respiration and thus render the somewhat inaccessible tear more superficial Here again the absence of diaphragmatic movements proved to be of great assistance in thorough and rapid suture. I repeated this mubilization of the disphragm in a couple of cadavers and found it satisfactory The transpleural route offered, of course, less difficulties in suturing. It was employed in three of the dogs The chest was opened by a rectangular flap containing bone, muscle, and skin and comprising two ribs. It was closed in two layers In the remaining four dogs the abdominal route was chosen None of the dogs died from the immediate effects of the operation. Insuffiction without other was usually continued from 5 to 10 minutes after the conclusion of the operation and seemed to have a highly stimulating effect upon the animal materially hastening its recovery from the anxisthetis also obsisting nausea and voniting Morphia was employed in the earlier experiments, but later discarded to avoid any influence upon the respiration and blood pressure. The experiments were carned on during yers hot weather, ascrais was also but partial This interfered much with ultimate results. The blood pressure usually roce when the diaphrigm was incised through the abdomen

Before attempting to draw any conclusions from these experiments it must be admitted that they were rather incomplete and limited in number Again the element of severe traumatic shock so constantly present in this class of injuries, as well as the frequent trauma of other organs, was absent. The anatomical and functional differences between the diaphraem of man and that of the lower animals does not permit of direct application of observations The method of fixation differs in the doc, inasmuch as the pericardium and diaphragm are not united and the heart does not depend upon the diaphragm as much in this animal as it does in man. Functionalfy it has not the importance for the circulation which it possesses in man, because, owing to the horizontal posture of the animal, a relatively small force is required to maintain the general circulation and promote the return of the blood from the abdomen. These advantages are offset by the frequent communication between the two pleural cavities in the dog. The normal as well as the pathological physiology of the diaphragm still offers many problems. I am indebted to the splendid work of Hans Eppinger for much information upon this subject, and shall

quote it freely: The following anatomical considerations are of importance In man the central tendon supports the heart, while the fibrous pericardium may be regarded as the fascial insertion of the muscular diaphragm. Through this fibrous pericardium and its continuation upward into the sheath of the great vessels, which in turn is continuous with the middle layer of the deep fascia of the neck and the carotid sheath, the dia phragm is closely connected with the great vessels. From beneath, the diaphragm is supported by the abdominal viscera, themselves kept in place by the tonic contraction of the abdominal muscles More specifically, the inferior supports are the liver and its falciform, coronary, and lateral ligaments Further supports are the inferior vena cava, through its attachment to the liver, and the stomach and intestines, which constitute an air cushion on which the solid viscera, especially the liver, are supported The diaphragm serves both as tractor as well as a compressor. It assumes its rôle of respiratory function only after birth, serving as a circulatory muscle during intrauterine existence

The diaphragm plays the most important role in maintaining equilibrium within the thoracic cavity. The tonus and the active force of the midrill antagonize the elastic force of the lang and the cobesion of the pleural layers Both forces Leep up the balance between clasticity of the lung, negative intrathoracic pressure, the tension of the diaphragmatic fibres and the other muscles surrounding the thorax. During moderate contraction of the diaphragm the enlargement of the thoracic cavity is caused chiefly by rendering the complementary space larger, while with deeper inspiration the centrum tendineum is considerably depressed. Ex-

cessive contraction of all the muscular fibres of the diaphragm may produce a horizontal position of this structure. Occasionally these contractions may become so strong that there is contraction at the very point of origin, with narrowing of the lower thoracic aperture. Normally several factors prevent this—amongst these, mainly, the costal inspiratory muscles and the increase in intra-abdominal pressure These may not only regulate but overcorrect the contraction and produce a widening of the lower thoracic aperture.

The importance of intra-abdominal pressure in this direction has been proven by Duchenne's Phrenic nerve stimulation causes spreading of the lower ribs with closed abdomen, which is changed to retraction as soon as the abdomen is opened The position of the diaphragm changes with posture, and this mainly depends upon resultant changes in intra abdominal pressure. The influence of the diaphragm upon the circulation has been alluded to before. From important observations the conclusion may be drawn that the diaphragm is one of the most important supporters of cardiac function as well as of the circulation This function can be observed throughout the animal series. from the lowest to the highest Keith points out the useful arrangement of the muscular bundles in relation to the heart and the inferior vena cava, whereby the right auricle is brought nearer to the blood reservoir with each contraction, facilitating its more rapid repletion The diaphragm is likewise a most important factor in the hepatic return circulation. It has been proven experimentally that the volume of the heart beat increases with each contraction of the diaphragm. The main function of the diaphragm may thus be summarized to be the following:

(a) Barrier between thoracic and abdominal cavities.

(b) Ventilation of the lung.

(c) Regulation of abdominal circulation. In view of this fact one might expect an injury to the diaphragm to be followed by

injury to the diaphragm to be followed by interference with the ventilation of the lung and disturbances in circulation. As the greater portion of respiration is internal, depending upon an exchange of gases between

DATE	NO.	ROUTE	POSITIVE PRESSURE	AV.ESTILETIC	PESULT
6-23-11		Chesi	Insuffation	Morphin, ether	Death after a week
6-30-11	,	Abdomen Transverse incision Resection of eighth, minth, and tenth rules	Insuffiction 25 mm and 30 mm	Ether, morphin	Death after 4 days Infection
8- 8-11	3	Abdomen Resection of car- tibge of eighth and much tibe	Insuffiction tomm and 35 mm 25 mm	Morphia, ether	Alive and well
8- 8-11	1	Chest Flap consisting of sixth, seventh, and eighth ribs	25 mm	Ether	Abve and well
8-11-11	5	Chest	35 mm	Ether	Death 4 days later
8-11-11	6	Abdomen Resection of ninth nb at junction with its cas lilage Resection of lenth in axillary line	as mm	Ether	Alive and well
8-18-11	8	Chesi	as mits	Ether	Tore wound open with teeth Infection Death after 3 days
8-31-81	L0	Abdomen	25 mm	Fther	Death 3 days later from

blood stream and tissues, the ultimate result would be insufficient agration of the entire system. Under ordinary circumstances this is counterbalanced by other forces which maintain coulibrium. In our experiments positive pre-sure permitted dislocation of the thoracic viscera, after Incising the diaphraem to quite a degree, without evil consequences In open wounds of the diaphragm without prolanse, the existing pneumothorax equalizes. perhaps, the deleterious effects of positive intra-abdominal pressure In subcutaneous runture conditions are different The action of the diaphragm, though impaired, will aspirate the viscera into the pleural eavity, creating there a condition of varying, though more or less positive, pressure as we tand it in the abdomen.

Why do these patients react so volently to the creation of an operative pneumothorax? One would rather expect that the entrance of air would equalize the pressure. A common pneumothorax is no longer feared by surgeons Differential pressure would not be required to offset the entrance of air, but rather to maintain equilibrium during handling of thoracio organs, causing more or less volent disturbances in equilibrium. The entrance of air into the chest cavity is followed by a collapse of the lung. This may be partial or complete according to the size of the aperture. It is complete if the aperture is greater than the diameter of the largest bronchus. In a normal chest cavity pneumothorax may not be associated with any symptoms whatsoever, as the following case well illustrates.

A colored grid received a lazor cut, severing the third, fourth and fifth left costal caralings at a lattle distance from the sternum. The internal mammary sitery was not injured. The cound was pulled apart by retiration, one could see a completely collapsed lung in the upper portion of the thorax. Neither heart nor lung were injured the wound was closed, no spectral symptoms were observed during examination. Dyspaces was very sight A complete recovery followed

This truly was a complete collapse of the lung, but not a pneumothorax, if we are to express by that term the alarming train of symptoms, other factors must evidently enter. These have been attributed to insufficient faxtion of the mediastinal pleura, which flutters to and fro in respiration (Murphy and Garré), kinking of the larger brough by displacement of the mediastina (Rehn), circulatory disturbances due to kinking of the great vessels (Friedrich), and a deficiency of the lung ventilation (Tiged); prolapse of stomath or intestines produces conditions which closely resemble those enumerated in closed or tension pneumothorax, so that one could speak of an internal pneumothorax if this term was not misleading. The entry of air from without must necessarily aggravate the symptoms, and if toleration is exceeded, that is, the thoracic equilibrium disturbed, with fatal results due to insufficient internal respiration.

There are undoubtedly other factors besides mechanical ones, and they may not unlikely be found in an increased sensitiveness of the visceral pleura, as experienced by Lewis and Capps. These observers found that touching a diseased visceral pleura with a needle during aspiration may lead to instantaneous death. Their observations showed the cause to be found in the sympathetic nervous system How much the element of shock, always present in subcutaneous injuries of the diaphragm, adds to increased vulnerability of the sympathetic system is not easy to determine

Diaphragmatic herniæ have frequently been operated upon with success long before the advent of pressure apparatus successes must be attributed to conformation of the chest contents to the alteration, for as a rule these cases are of more or less long standing, and here a pneumothorax would not produce the fatal disturbances as in the acute cases under consideration It has been argued that the transpleural approach in diaphragmatic rupture will give better results; that the operative pneumothorax will counterbalance position pressure in the thoracic cavity. The few cases, however, which recovered after operation have been laparotomized. The variations in the character of the mediastina must be taken into consideration. In the child they are much thinner than in the adult, and the thickness varies greatly in different individuals.

As stated before, subcutaneous ruptures are not as rare as one would believe. It is surprising to find, in Lachner's compilation of 266

cases of diaphragmatic hernia, the following relations:

This furnishes positive proof that the condition is more frequent than would appear at first glance and should be looked for in examination of persons suspected of having sustained a subcutaneous trauma of the chest or abdomen, during operation as well as before. It is not necessary to dwell here again on the disastrous consequences of this injury, either immediate or remote, as they are well known In surgical text-books this form of subcutaneous injury receives but scant mention. The cases of Suter and Walker are about the only ones where operation was undertaken for the previously diagnosed condition. The mechanism of diaphragmatic rupture is not uniform. The commonest is a rise of intra-abdominal pressure, transmitted through a medium of gas and fluid, which pushes the diaphragm upward and stretches it beyond the point of endurance The rupture may be the result of a forcible straightening of the ribs and pushing up of the thorax, such as occurs in a more lateral compression of the lower chest and abdomen An intermediate between runture and stab wounds is represented by perforations of the diaphragm by a fractured rib. This is uncommon. The increase in intraabdominal pressure causes at the same time forced expiration, and with it a minimum of intrathoracic pressure. The diaphragm is deprived of its brace above, and ruptures.

The most common causes of increased intra-abdominal pressure are run-overs, burying accidents or falls from a height. It is an interesting fact that this increased tension may work in two directions, either upon the diaphragm or upon the pelvic floor; if very excessive it may attach, both (Kirschuer's case). The diaphragm generally ruptures at its outer margin, in the muscular portion. Obviously the rupture occurs more often on the left side (§ 6.7), because the compact and non-yielding liver receives and breaks the

force on the right side, thus protecting the diaphragm. Rupture as the result of muscular contraction of the diaphragm is exceedingly rare. Konig asserts that this will hardly occur without previous degenerative changes. The tear in this variety affects the centrum tendineum. Sutur eites three cases from the literature, reported by Desiret de Fortunet (Lyon med , 1886). One was that of a woman who sustained a rupture of the midriff during labor; the second, of a man during a violent attack of comiting, pro duced by an emetic, while the third suffered the same liqury during an attempt to bold up a heavy barrel These injuries took place during forced inspiration, while the traumatic variety takes place during forced expiration. Malgaigne is of the opinion that ruptures of the muscular portion occur during expiration, those of the eentral tendinous part during inspiration The symptoms of diaphragmatic runture depend largely, if not altogether, upon the prolanse of abdominal organs small tear without prolapse will not present any diagnostic signs. The so called classical symptoms and signs might conveniently be grouped under three classes

(a) Those due to insufficient air supply Excessive dispunca orthopana

Rapid, irregular weak pulse

Anxious facial expression amounting at times to a risus sardonicus, as mentioned by Percy, a French physician

(b) Those connected with the displaced organs Voniting, due to traction on the mesenteric attachments of the displaced success or by actual interruption of the blood supor.

Muscular defense as a consequence of a lesion of the peritoneum

Physical signs

Tympany over the chest, amphoric breathing, succussion or gurgling sounds over the chest.

Widening of the chest

Distention of the epigastrium
(c) Symptoms referable to injury of the dia-

phragm Terky respiration.

Pain on forced inspiration or coughing.

(d) Referred symptoms.

Pain in the shoulder, due to irritation of branches of the phrenic nerve.

General symptoms of a severe trauma, such as shock, are rarely absorbit; associated visceral lesions may overshadow the symptoms of diaphragmatic rupture to a large degree. It is hardly necessary to state that, with the exception of actual physical finding, of prolapse, the remainder of the symptoms are merely sugrective.

SUMMARY

1 The diaphragm in man has an important influence upon the heart's action, by its anatomical relation to the heart and pericardium

2 It is an important factor in the circulation by aiding venous return, especially from the abdominal cavity

3 It plays an important part in maintaining combibrium in the thoracie cavity.

4 Rupture of the diaphragm must needs be followed by serious disturbances in internal re-piration and in the equilibrium within the thoracic cavity.

5 The inevitable prolapse of abdominal organs following subcutaneous rupture still increases this condition, frequently producing a state of positive pressure in the thoracic cavity.

6 The use of differential pressure is absolutely necessary to overcome these fac-

7 It will insure better results, in these cases, permitting furthermore the choice of abdominal or transpleural route or both as the occasion requires

8 The character of pressure, whether positive or negative, is of little consequence, but the method of Meltzer is simple and can be

used anywhere.

9 In cases of suspected subcutaneous rup-

ture of the diaphragm, insufflation should be employed with low pressure (10 to 15 mm.) before operation, to overcome the deleterious effects of disturbed intrathoracic equilibrium.

Case 1 Woman, 40 years old; fell from wagon, then run over Several ribs broken on each side of the chest Drunk No sign of shock. No vomiting No dyspnen. Death on following morning Post-morteen: Fracture of third to elepth ribs on right side; lourth to eleventh ribs on left side Left pleural sac contained stomach, spleen, transverse colon, and several feet of small intestine Left lung was collapsed. The left does not the diaphragm was completely torn across

Lesion not suspected ante-mortem CASE 2. Woman, for years of age Wheel of van passed over the lower part of the chest. Disacharged from hospital, at end of seven days, apparently well. Attended to house duttes, but never seemed well since the accident, occasional attacks of breathlessness. Ninety-one days after accident, was out during the whole morning, but, on returning home, said she did not feel well and went to bed, At 6 p u she was given a large quantity of soils water, and immediately afterwards she vomited and became uconscious. She did not rally, and

died three hours later

Tost-mortem The left pleural sac was almost filled by the normously dilated stomach. The lung was very small and was flattened against the left side of the spine, while the beart was so far disloged as to he entirely to the right of the middle into The left side contained, also, the sphere and three feet of small intestine. The left dome of the disaphragm was completely torn across from front to back, while the viscera entening and leaving the chest were tightly stranged by the sharp creatmed edies of the rent. There was no injury to the chest appear to have resulted from acute distention of the stomach by gas derived from the effervescent drawaht.

CASE 3 Henry M, age 50, fell July 2, 1006. twenty feet, striking on occuput, became uncon-After three hours brought to Cook County Hospital, semi-conscious Odor of alcohol on breath Pulse 68, weak Respiration 20 Tem-perature 98°, rectal Scalp wound 5 cm long over occuput, no depression of bone Pupils equal, no paralysis Patient rapidly gained consciousness At first no abdominal signs were present Not tympanitic or rigid. As consciousness returned, pain became intense in epigastrium. Much nausea, but unable to vomit Abdomen grew rigid Tympanitis came on quickly. Great dyspnora and pain on inspiration. Urine negative. The left chest was hyperresonant the heart being pushed to right It was evident that the lung was collapsed and that air had taken its place. Cyanosis and dyspinora increased, and in eight hours the patient died, before operation was deemed possible

Post mortem Brain negative The perstoneal cavity contained a large amount of stomach contents. The stomach was ruptured near its cardiac end on the anterior wall and greater curvature. The diaphragm was ruptured into the left pleural cavity with a laceration admitting the hand. Through this orifice a large amount of small intestine had been forced, formure a traumatch bernia.

nearly filling the side of the chest, thereby causing the tympanitis, resonance and great dyspnora, possibly also embarrassing the heart. The peri-

cardium was not torn.

CASE 4 E W Andrews (Surg., Gynec & Obst., 1007) Rupture and hernia of diaphragm Lahorer sat on ground, with extended legs, leaning against a pile of boards. The pile collapsed and fell upon the man He was found, knees touching shoulder, head between knees, unconscious. Brought to hospital 41/2 hours later in collapse. Strong man, 28 years old Temperature 36°. Complains of dyspaces and pain in left chest No fracture of the ribs. Tympany and percussion over left chest from clavicle downward This obscured cardiac dullness completely from seventh rib downward to ninth rib absolute dullness, passing from sternal line into the region of splenic dullness. Pulse 68 Abdomen soft, not rigid or sensitive to pressure, except slightly in region of stomach Heart tones purc, regular, weak At 10 P M, somewhat better. Temperature 37° Dullness had ascended to sixth rib At 4 A M vomiting for the first time Vomited repeatedly Died at 7 A M during severe vomiting

spell Post-mortem. Intestines slightly injected Beneath left costal arch a portion of omentum two fingers wide Stomach not visible. Beneath lelt costal arch is a tumor of the size of a child's head, covered by the transverse mesocolon Strong traction upon the omentum and organs situated helow is of no avail Omentum tears, but cannot be debvered Exploring hand glides into pleural cavity without resistance. Air enters simultaneous-Pleural cavity filled with two thirds of much distended stomach the middle portion of the transverse colon (but little distended), the omentum and the spicen Stomach and colon show a place where constriction has taken place, the lurrow is two fingers wide showing suggillations Left dome of diaphragm bas a tear 12 cm in length, beginning anteriorly in mammillary line passing sagittally to dome and enoing posteriorly at the middle of the twelfth rib The gap in its centre measures about 4 cm Thoracic and abdominal cavities contain about a cupful of blood. If abdominal organs are released they slowly glide back into the thoracic cavity No other injuries in abdominal organs 1

CASA 5 Miner Burned under masses of ore. Unconscious at first Recovered soon No vomiting Violent pain in gastric region. Pulse small, appd Hiematoma over left chest anteriorly. Such to tenth ribs fractured postenorly and below, sight duliness over lungs. Unen cormal, later bloody. Great tendency to cough. Later vomitions of the control of the cont

Post-mortem: Two thirds of stomach in left thoracic cavity: left lung displaced upward; the

Weischer Zentralbi I Chir., 1900

few hours.4

heart displaced hackward. Superficial tear in stomach. Intestines much distended; mesentery ecchymotic. One pint of hlood in abdominal cavity. Spleen normal Tear in disphragm leading directly into perioarchal cavity, another tear of the control phragm on right side. Eight liver ruptures distributed over conventily. Rupture of the right kidney, also left kidney; lower one third almost detached.

Case 6 Fireman Buffer accident. Unconscious Temperature normal Pulse small and rapid. Dyspacea No respiratory sounds over left chest. Swelling in left lumbar remon between eleventh rib and iliac crest Blood in urane Czerny incision to expose kidney The daphragm is found to be torn from its attachments in the axillary line to the extent of 18 to 20 cm Pericardium and lung are visible. Anterior portion of twelfth rib is fractured This is removed. Upper one third of kidney torn off. The wound in the diaphragm is closed in such a manner that the inner margin of the diaphragm is attached to the thoracic wall hy interrupted sutures Some pneumonic symptoms, exudation, recovery Examined one year later, vesicular breathing over both lungs. General condition apparently normal 1

CASE 7 Man, 70 years old, tred to evade a kicking horse, fell on his hack. A wagon grazed a kicking horse, fell on his hack. A wagon grazed the right chest and lumbar region Lips cyanotic Pulse 12st, respiration 40 Some emphysicing the result of the resu

Bergmann, Zentralbi f Chir, sgoo, Ed 27, p 2706

Post-mortem Rupture of diaphragm in antenor portion on the right side. Tear occluded by omentum. Both lungs lacerated by fractured ribs.

omentum. Both lungs lacerated hy fractured ribs'
CASE 8 Gril 20 years old. Buried under a
large load of sand, covering the lower portion of the
body. Large tear in gential region on the right
side, from mons veners to anus Exitus after a

Post-mortem: Rupture of diaphragm Prolapse

of stomach and intestines.

CASE 9. Laborer thrown to ground by falling tree Twenty hours later: grave shock. Pulse 445, soft, thready, severe dyspinea. Violent pains in left chest, bloody sputtum, facal vomitting, naucar Tympanutic note over base of lung, amphone breathing, succusion sound. Apex heat two inches right from normal. Fracture of seventh and eighth ribs postally displangual therita. Laparotomy. Strangulational loop of gut in rateful. Applications of the control of the

CASE TO. Boy, 2½ years old, fell from second story on 100 fence Large abdominal wound with intestinal prolapse. Prolapse of stomach and intestine into left pleural cavity. Suture of large wound in diaphragm and stomach Exitus after a few hours Suture intact 1

LITERATURE

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DO THE PARATHYROIDS FUNCTIONATE IN INTRAUTERINE LIFE? 1

BY AXEL WERELIUS, M D., CHICAGO From the Hull Physiological Laboratory, University of Chicago

ARLSON,2 in examining the urine of a pancreatectomized pregnant dog, found that the post-operative rise of sugar was more delayed and the highest percentage less than in non-pregnant dogs. From this he theorized that probably the pancreas of the foctus might furnish and transmit into the blood of the mother a quantity of internal secretion sufficient for a normal sugar metabolism Subsequent experimentation proved the correctness of his

Influenced by his work, I reasoned that probably in parathyroidectomized pregnant dogs, tetany would be delayed till after delivery by a compensatory function of the fœtal parathyroids, and, in fact, that the symptoms usually associated with the removal of any organ of internal secretion might be delayed, or at least alleviated in pregnant

dogs until post partum.

deductions.

In regard to the parathyroids this supposition, however, proved entirely fallacious, as my thyroparathyroidectomized dogs went into tetany earlier and died sooner than nonpregnant ones.

In looking over the literature, I found that somewhat similar work had been done, although not with the same object in view.

Halsted resected one thyroid lobe in a pregnant dog. The operation was followed by tetany, which subsided only with termination of pregnancy.

Verstraten and Vanderlinden performed partial thyroidectomy in a cat. Three years later the animal conceived and died in tetany.

Adler and Thaler | found that following partial thyroparathyroidectomy, tetany came on earlier and in a severer form in pregnant

than in non-pregnant rats Caro, in a great number of experiments, whereby he proves to his own satisfaction that

'J Am Physiol., Exvill, Oct. 2, 1911.

tetany is due to resection of the thyroids and not the parathyroids, also used some pregnant dogs which I noticed died very soon after complete thyroparathyroidectomy.

His work, founded as it is upon a faulty knowledge of the dog thyroid, is, bowever, of very doubtful value, unless it could be used to prove just the opposite of his contention, which, I believe, it does,

A few cases in the human have been reported in which partial strumectomy (including of course, the paratbyroids), was followed by tetanic convulsions in pregnancy, ceasing only with its termination.

The most interesting of these cases is the

one reported by Meiner.

This woman underwent a partial strumectomy in the fourth month of pregnancy, followed on the third day after the operation by tetany, which continued at irregular intervals during the remainder of the pregnancy, ceasing at once after delivery. A few years later. the patient again becoming pregnant, tetany reappeared, followed by abortion and again cessation of convulsions.

Reasoning as above, that the parathyroids of fœtal pups might work vicariously in parathyroidectomized mothers. I selected does in later stages of pregnancy, possibly within two or three weeks of term. Complete thyroparathyroidectomy was done in all of them, and in order to cause the least possible disturbance, very light ether anæsthesia was given and operation completed as rapidly as

DOG I

was consistent with thorough work.

Was operated 12:30 P M., October 17, 1911. The animal, after coming out of the anæsthesia, appeared in splendid condition the rest of the day. October 18th, 8 co A M., we noticed slight tremor

of the neck, muscles, and front legs. At 11'00 A. M., there was added a spastic condition of all the extremities, but no convulsions; pulse 140; resp. 44, very labored; temp. 101.2°. Abdominal palpation

⁷ Ztechr f Geburteh, u. Gynlk , 1903, 61, p. 194-113. Mitt a d Grenzgeb d. Med v Chir , 1908, 17. p. 447-468

¹ Arches 1. Cynth . 2803. 55. D 446.

t Read at the joint meeting of Chicago Medical Society and South Sale Branch, May 25, tors

demonstrated fortal movements. Vaginal eaamination was negative. 5 00 P. M. same

October 19th, 8:00 A. M., no tremor; no spasm; less depression; the dog sits up 500 P. M. same.

October 20th, 9:30 A. M., pulse 96; respiration 28; temperature 99 2; apparently normal 5:00 P. M. same.

October 21st, 8 00 A. M. dog found dead Postmortem gave evidence of beginning labor, otherwise negative. Weight of mother 8.5 kg. Weight of her thyroids 482 gr. Weight of pups 1.5 kg Weight of pups' glands 1.6 gr.

Operation October 25, 1911, 12 16 P H 6,30 P. M., good condition with slight tremor of neck muscles

October 26th, found dead Post-mortem negative. Weight of mother 6.4 kg. Weight of her thyroids 4 82 gr Weight of pups o 73 kg Weight of pups' glands 0.7 gr.

DOG 3

Operation October 27, 1011, 11 10 A M Thyro parathyroidectomy

October 28th, 9.00 A M , one pup born At times slight tremor and rapid breathing, no spasm, pulse 120; temperature 101 2°, respiration 40 5 00 P. M. some tremor, rapid respiration, second pup born to oo P M . dog in fair condition, one pup born be-

tween 5 oo and to oo P. M

October 20th, 10 00 A M, dog in good condition,

slight tremors, another pup burn Mother takes the usual care of pup at birth October 30th, 10.00 A M, tremos (general)

spasms of front legs; pulse 140, respiration short, hurned, 52, temperature 101 6°, two pups horn 1.15 P. M , same

October 31st, no tremor, no spasm pulse to4, respiration 24, temperature 101 8

November 1st, 9 30 A 11, dog dying, killed, post-mortem negative Weight of mother 9 2 kg Weight of her thyroids 6 10 gr Weight of pups 1 04 kg. Weight of pups' glands o 58 gr

DOG 4

November 2d. 3 oo P M . thytoidectomy, thyroids enlarged and very vascular, apparently a small hæmatoma in one lobe

November 3d, found dead, five pups living Post-mortem decided hyperamia of upper part of gut. Weight of mother 14 40 kg. Weight of her thyroids 7 o gr Weight of pups 1 04 kg Weight of pups' glands 46 gr.

DOG 5

Thyroidectomy November 15th, 10 30 A M 5 00 P. M , in good condition

November 16th, 10 00 A H , tremor of all muscles, no spasms, pulse 120, temperature 101 2º 5 00 P. M., characteristic tetany.

November 17th, 8 25 A M. dog found dead.

Post-mortem negative. Weight of mother 28 kg Weight of her thyroids 2.6 gr. Weight of pups 0 47 kg. Weight of pups' glands o as gr.

DOG 6

Thyroidectomy November 15, 1911, 11 00 A. M. 5.00 P. M, in good condition.

November 16th, 10 00 A. M., tetany (characteristic) Fluoroscopic examination was used in order to determine whether the fortal pups were in tetany, but we were unable to assure ourselves as to whether or not Temperate 1018°. Dog died at about 12 00 11 , was posted at once; six pups dead; temperature of one of these 102°, stomach somenhat contracted. Weight of mother 8 2 kg Weight of her thyroids 4 15 gr

DOG 7

P Thytoidectomy November 18th, 10:30 A M November 19th, 10 30 A M., general tremor, dog hes down 5 oo P M, characteristic tetany,

November 20th, 10 00 A. M. tetapy; severe, vaginal examination negative. 5 00 F. M., dog found dead, post-mortem negative. Weight of mother 76 kg

DOG 8

Thyroparathyroidectomy February 15th, 10 00 A M., 4.00 P M, condition good. 8.00 P. M, tremor in neck muscles

February 16th, 8 00 A M. dog found dead, still warm, four pups dead Post-mortem negative. Weight of mother a 8 kg Weight of her thyroids 7-7 gr Weight of pups 5 70 gr Weight of pups' glands 1 2 gr

DOGS 9 AND 10 Died within twenty-four and forty-eight hours

respectively Records lost

The results in this work were so uniform that I did not deem it necessary to use a greater number of animals

The rapid demise of these dogs, however, made me at first think that probably there was something radically wrong with my technique; so in order to eliminate this factor, I asked Carlson, who is vastly my superior in this work, to operate some of the dogs His

two dogs, however, died within twenty-four hours The convulsions came on very early, but I did not observe, as did Adler and Thaler in rats, that the tetany was more severe than in non-pregnant dogs. The average postoperative life was about two days; five dogs

died within twenty-four hours.1 In this laboratory, non-pregnant dogs

*It is specially interesting to note that does No 3 and No. 9 lived forgest (save No. 2), and also here several pupe before death

lived from five to ten days after thyroparathyroidectomy. Why this difference in duration of post-operative life in pregnant and non-pregnant dogs? Clearly it lies in the condition of pregnancy; but why?

Is it due to a lessened body resistance incidental to the state of conception, or is the system overwhelmed by deleterious products from the fectus and the placenta that would otherwise be neutralized by the parathyroids? The former is hardly likely as the animal then would probably depart from shock. Immediately following the operation, when entirely out of the anasthesia, the animal may not show the least disturbance

The latter supposition is more probable and is supported by the cases and experiments mentioned above, in which partial parathyroidectomy was followed by tetany.

In these cases, the parathyroids were able to control the situation under ordinary conditions, but when the state of preganacy was added, there was a relative hypofunction; the gland not being able to take care of the added products from the fetus

This makes me doubt whether the particular glands in question functionate at all with under the fife. Probably these, and also some other organs, as the lung, are thrown in action only simultaneously with extrauterine existence

Should these glands functionate as they do later in life, then there would be no extra ma terial thrown on the parathyroidectomized mother, as each gland would take care of its own pup, and consequently life should not be very much more shortened than in non-pregnant dogs, unless, of course, the whole secret lies in the placenta.

Halsted has shown that thyroid of fectal pupes in a partially thyroidectomized mother underwent hypertrophy, supposedly of a compensatory nature. If his experiments were done on mothers with hyperplastic glands, then they are not at all conclusive, as in two mothers with enlarged thyroids of above series, I found all the pups with greatly enlarged glands.

This thyroid enlargement in feetal pups of goitrous mothers thus furnishes a direct evidence of the hereditary origin of

struma, at least in early life in some of the

That such compensatory function as described by Halsted does not take place in the parathyroids is very likely, because if it did, then death would not come sooner, but would be at least deferred in pregnant does.

It would be of great importance if one could ascertain whether the feetal pups also go in convulsions with the parathyroidectomized mother.

Tetany of the factus would favor the supposition that the parathy roids were inactive at this early period, but not entirely prove it, as the fectus might be completely overpowered by substances from the maternal blood Lack of convulsions might possibly mean glandular activity. Carlson and I used the fluoroscope as above, but were unable to make out whether pups were in spasms or not Probably it could be done in smaller animals Whether the parathyroids are active at once after birth, or, if not, at what period, could, of course, be demonstrated by thyroparathyroidectomy of pups at different

ages
I have, so far, done only one a week old.
It was found dead in forty-eight hours. No convulsions were seen, but it may have had only one Other glands should be used for this work, especially the suprarenal one. As I have used only one dog for this work (in a poorly done operation). I can give no opinion. The animal used, however, died sooner than most of those non-pregnant ones on which the same operation has been practiced in the laboratory.

There is no doubt but that the removal in pregnant animals of any organ or sets of organs of an internal secreting or eliminating function would hasten, and possibly intensity the symptoms ordinarily associated with such removal, unless, of course, compensated for by vicarious organic function in the foctal pups (Such compensating function would, of course, be of no avail when it concerns organs of elimination)

The post-operative life of pregnant thyroparathyroidectomized dogs should, it seems to me, bear some relation to the stage of conception.

The earlier in pregnancy, the longer death should be delayed, as then a less amount of extra products would be thrown on the mother than later in pregnancy, when the animal, as is seen from above, may become rapidly overpowered by an excess of nonneutralized substances, of the nature of which we know absolutely nothing, and the presence of which we surmise only by their powerful and destructive symptomatic manifestations

The results in this work may, in a measure, support the parathyroid theory of eclampsia without by any means proving it. It was interesting to note that in the pups of this series, the left gland was almost invariably the larger and heavier, exactly the opposite from the condition in the adult.1 The relation between glandular and body weight in the pups of mothers with enlarged thyroids was as low as 1-130, whereas in other pups from non-goitrous mothers, from 1-1000 to

I-2000. The relation between the hody weight of the mother and that of her glands averaged 1-1180 and in the pups 1-1049 Thus the

Werelus, J Am M Am lau, p 440 Werelus, burg, Cynec & Obst Aug 1969, p 151

glands of the pups were relatively slightly larger. The relation between the weight of the glands of the mother and of those of the pups averaged 1-8.

Careful microscopic examination is being made of each gland, but as the work is not yet completed, it will be reported in a subsequent paper.

CONCLUSIONS 1. Thyroparathyroidectomized pregnant dogs (in later stages) seemingly go in convulsions earlier and die sooner than non-preg-

nant dogs. 2. In thyroparathyroidectomized pregnant dogs, feetal parathyroids prohably do not

then compensate for the mothers' glands 3. Possibly some glands of internal secretion do not functionate in intrauterine bie. 4 Undoubtedly, the earlier in pregnancy

thyroparathyroidectomy is performed, the longer the post-operative life.

5 The results in this work may in a sense support the parathyroid theory in eclampsia.

6. Direct evidence of heredity as an etiologic factor in goiter is shown in this series.

7 In feetal pups, left thyroid gland is almost always the larger

THE INFLUENCE OF MYOMATA ON THE BLOOD SUPPLY OF THE UTERUS, WITH SPECIAL REFERENCE TO ABNOR-MAL UTERINE BLEEDING¹

BASED ON THE STUDY OF 150 INJECTED UTERS CONTAINING THESE TUMORS By IOHN A SAMPSON, M. D. ALBANY, NEW YORK

THE purpose of the present article is to show the blood supply of uteri containing myomata, with reference to the changes caused in it by these tumors, and especially those which would lead to abnormal bleeding, as found in the clinico pathological study of 150 injected uteri containing myomata.

At the last meeting of the American Gynecological Society, held at Atlantic City, May 24, 1911, I presented a paper entitled "The

Blood Supply of Uterine Myomata (Based on the Study of 80 Injected Uteri Containing These Tumors)." This paper, which included a study of twenty more injected specimens, was presented before the second annual session of the Clinical Congress of Surgeons of North America on November 15, 1911, and appeared in the Transactions of the American Gynecological Society for igit, and in SURGERY, GYNECOLOGY AND OBSTETRICS, March, 1912.

The present study is a continuation of the previous one, and is of greater clinical value, because the changes in the circulation of the uterus caused by these tumors contribute more to their symptomatology and interfere more with the health of the individual than the blood supply of the tumors themselves

The literature of this subject, based on the study of injected specimens, is meager and has already been referred to in the previous paper.

The material for the present study consisted of the 100 injected uteri containing one or more of these tumors which were used in the preparation of the previous paper, and 50 additional ones, all of which were removed at operation and injected soon afterwards

The injection mass used was 15 per coot gelatin which contained in suspension either a pigment or some material (usually hismuth subcarbonate) which was impervious to the X-ray In 52 specimens, either the arteries or veins, or both, were injected with a pigment (if both were injected, Venetian red was used for the arteries and ultramarine blue for the veins) In the remaining 98 specimens, one vascular system was injected with a mass impervious to the X-ray, and the other system was usually injected with a colored mass Stereoscopic radiographs of the specimens injected with the mass impervious to the X-ray were found to be of great value in the study of the various phases of this subject

The material for this study may be grouped according to the clinical diagnoses made before the operation, as follows. Myomata, 79, pelvic inflammatory conditions, 20, uterine bleeding of obscure origin, 16, ovarian cysts, 12; carcinoma of the cervix, 8, carcinoma of the body, 5, descensus and retrodisplacements of uterus, 5, ectopic pregnancy, 3, hydatiform mole, 1, sarcoma, 1 This shows how frequently myomata are encountered when operating for other conditions, i c . over fortyseven per cent of the material was obtained at operations which were undertaken for other conditions than myomata

THE BLOOD SUPPLY OF THE NORMAL UTERUS

The course of each uterine artery along the side of the uterus and its free anastomosis

with the ovarian artery of the same side are well known (Fig. 1). From each uterine artery branches arise, at intervals, which penetrate the uterus; each one either divides into two branches, one supplying the anterior and the other the posterior uterine wall, or without dividing it supplies either one or the other uterine wall At the level of the internal os their course within the uterus is at right angles to the long axis of that organ; helow this level it is inclined downward, while above it is directed obliquely upward and the arteries themselves are larger. Frequently one intramural artery is much larger than the rest and appears as a terminal branch of the main uterine artery. This is known as the fundal branch These arterics present many minor variations, but the general plan of their origin and course is the same main intramural arteries which I have called "arcuate" lie between the outer and middle third of the uterine wall, and each one supplies a quadrantal segment of the uterus corresponding to a segment of either the anterior or posterior half of the Mullerian duct of that side (Fig 2) They terminate in median peripheral and radial (centrinetal) branches. The peripheral terminal branches of some of the arcuate arteries of one side anastomose freely with similar branches of arcuate arteries of the opposite side, thus establishing a free communication between the two main utcrine arteries Along the course of each arcuate artery, radial (centripetal) and peripheral (centrifugal) branches arise. The radial branches are the larger and more numerous They supply the myometrium, mesial to the arcuate artery from which they arise, and terminale in the endometrium peripheral arteries nourish the peripheral portion of the myometrium There is a free anastomosis of the arterioles of the peripheral branches of neighboring arcuate arteries of the same side, and also of the arterioles of the radial branches near their origin from the arcuate artery, but the distal portion of the radial arteries are apparently end arteries

The arterial system of the uterus enables us to divide the uterine wall into three zones: first, the peripheral (the outer third), which is nourished by the peripheral arteries; second. the arcuate, the narrow zone in which the arcuate vessels lie; and, third, the radial (the inner two thirds), which is nourished by the radial arteries

In order to distinguish the arteries from the veins, an injection mass of sufficient coarse ness was used so that it usually did not escape through the arterial capillaries into the veins, and as a result I may have failed to inject some of the finer capillaries of the endometri um. The fine terminal branches of the radial arteries penetrate the base of the endometrium, and arterial capillaries were found to extend only a short distance in the uterine mucosa. On the other hand, the veins of the endometrium (the venous capillaries) are easily injected through the uterine and ovarian veins Occasionally the arterial insection mass escaped from the terminal branches of the radial arteries into the venous plexus of the endometrium, and these specimens presented a very confusing picture, as the arteries and veins contained the same mass, and even if the arterial mass was followed by a venous one of another color the arterial mass

remained in the veins of the endometrium The arrangement of the venous system of the uterus is as follows (Fig 3) First, a rich plexus in the endometrium, which is fed by the terminal branches of the radial arteries to which reference has been made, second, a similar but larger plexus of the myometrium, which communicates with that of the endome trium by venous channels There is often a narrow zone of the myometrium about the endometrium which is relatively anamic (under normal conditions), and through which the venous channels pass, uniting the two plexuses This "protection" zone is possibly an important means of regulating physiological as well as pathological uterine bleeding, as will be considered later About the periphery of the myometrium, especially on the sides, and sometimes accompanying the arcuate arteries, are collecting veins which convey the venous blood of the uterus to the uterine veins situated between the layers of the broad ligament Since the entire venous system of the uterus is easily injected through the uterine and ovarian veins, the intrinsic uterine veins do not contain valves

The study of the uterine circulation from the injected specimens, bearing in mind that there are not any valves in the veins and that the uterus is a muscular organ which may relax and contract, suggests that the relaxations and contractions of the uterus may be of great importance in aiding its circulation, i e., the uterus is essentially a "pelvic heart" (Theilhaber) This "cardiac" function is seen during pregnancy and menstruation and possibly may occur during the quiescent non-pregnant condition, although I have not been able to obtain any definite proof of the latter When relaxed the plexuses of the endometrium and myometrium would be filled with venous blood and the arterial blood would easily gain access to the endometrium, and in contracting, this blood would be forced out of the uterus into the pelvic veins. My studies support the views of Theilhaber in regard to the importance of the muscular efficiency of the uterus in aiding the uterine circulation

and in regulating uterine bleeding During pregnancy the uterine arteries increase in size, and the arcuate arteries whose radial branches nourish the placenta become hypertrophied The venous plexus of the myometrium is distended with blood when the uterus is relaxed. On account of the increased vascularity of the organ as a whole, the demand for its "cardiae" function is greater than in the non-pregnant condition, and it is in pregnancy that the intermittent contractions are most noticeable After labor the process of involution occurs, and Goodall believes that the uterus renews all of its arteries, the renewal consisting in the building of a new vessel within the lumen of the

old one
Adler and Hitschmann have divided the
menstrual, ede unto four perods: the postmenstrual, interval, premenstrual and menstrual. At the post-menstrual period they
describe the endomerium as thin, anemic and
smooth. It gradually increases in thickness
as the individual approaches menstruation,
and at the permenstrual period it is thicke
and more vascular than at any other time.
By the process of menstruation, the endo-

metrium assumes the post-menstrual condi-

It would also seem that the entire uterus contained more blood in the premenstrual period, and that menstruation may be looked upon as a form of labor, followed by a process of involution differing in degree from postpartum mydultion

I have studied all my specimens with a knowledge of the age of the patient, and the date of the last menstruation if operated upon before the menopause, and have injected several specimens from patients who were menstructing at the time of the operation I have found that the endometrium differs so much in its thickness and vascularity in individual cases that it is impossible to determine the exact stage of the menstrust cycle from the appearance of the endometrium except during the actual flow have seen the endometrium thick and very vascular within a week after the menstrual period, and relatively thin in the premenstrual period. It must be borne in mind that the degree of congestion during life cannot be determined from the injected specimen; nevertheless my work in a general way confirms the descriptions of Adler and Hitschmann as to the changes of the endometrium in the various phases of the menstrual evels As a woman approaches the menopause the uterus becomes less vascular, both arterial and venous, the endometrium and uterine wall become thinner, and the proportion of the muscle to connective tissue changes in the wall, the connective tissue predominat ing I believe that injected uteri can only be intelligently studied when both the age of the patient is known and the date of the last menstrual period, irrespective of the pathological condition present

THE FACTORS REGULATING MENSTRUATION

In the present communication we are specially concerned with the vascular changes in the utents leading up to and associated with menstruation. What causes the onset of the flow? Why does it ontinue for a certain number of days? Why does it stop? Why irregular or regular, scantly or profuse, of short or of long duration?

OVARIAN FUNCTION AS A FACTOR IN REGULAT-ING MENSTRUATION

We know that ovarian activity or function responsible for the menstrual cycle. If the ovaries have been entirely removed, the changes in the uterus leading to menstruation do not take place, and physiological uterine bleeding will not occur

On the other hand, ovarian activity may normally exist, and yet the individual may not menstruate, as shown by women becoming pregnant before puberty, during the amenorrhoea medent to lactation, after the apparent menopause, and in those with suppression or absence of menstruation due to other causes A non-pregnant woman then, with apparently normal ovarian function as far as oxulation is concerned, may not menstruate If she does not, its non appearance is due to some condition within the uterus, or even outside I have long been impressed with the fact that patients with abnormal menstruation, either irregular scanty, profuse, or prolonged, may have ovaries which anatomically and histologically appear normal. We also find extensive pathological condition of the ovaries, especially large exists, in patients with normal menstruation. We must conchide that the influence of the ovaries on inenstruction, both as regards its periodicity. the duration of the flow, and the amount of blood lost whether scanty or profuse, is not so much dependent upon the anatomical structure of the ovaries, which we are able to detect, as upon their functional activity and the interrelation between this and the uterus. and the influence of other factors which we have not yet definitely determined. Here again, as will be shown, the functional activity of the uterus plays an important part in regulating the amount of blood lost, and the latter is not dependent entirely upon anatomical changes which we can detect.

THE ENDOMETRIUM

The menstrual flow occurs as an escape of blood from the endometrium into the uterine cavity. A study of the mjected specimens shows us that the distal portion of the radial arteries terminate in the endometrium, and that these branches are very small, and the

capillaries supplying the uterine mucosa are very difficult to inject with the material I have used (Fig. 2). On the other hand there is a rich venous plexus in the endometrium. whose blood is carried by venous channels to the venous plexus of the myometrium (Fig. 3). If a uterus, removed from a patient who was menstruating at the time of the operation, was injected, the arterial injection mass did not escape into the uterine cavity but the venous injection mass always did. This we would expect from the study of injected uteri removed in the intermenstrual period. From my studies I would infer that the normal menstrual flow is entirely a renous hamorrhage from the zenous plexus of the endometrum, and st is only possible when there are changes in this plexus which will permit the blood to escape I offer as proof of the latter statement that I have never seen the injection mass escape into the uterine eavity unless the nationt was flowing (either physiologically or pathologically) at the time of the operation, or else just before or after such a flow. The venous plexus is very strong during the intermenstrual period, for I have often purposely used great force, and yet the injection mass did not escape into the uterine cavity When the injection mass escaped, it occurred either in the form of oozing from the portion of the venous plexus just beneath the endometrial epithelium, or a "hæmatoma" of the mass formed in the endometrium, with subsequent rupture of the portion of the mucosa over it, permitting its escape into the uterine cavity (Figs. 4 and 5).

Adler and Illischmann state that the endo metrium is thicker just before menstruation than at any other time, and that this thickness is due to actual hypertrophy, with marked glandular hypertrophy and increased vascularity. As changes in its venous plexus are necessary for the escape of the blood and as there is often a marked glandular hypertrophy at this time, suggesting an increased glandular activity, the views expressed by Frankli that menstruation is a biochemical process dependent upon a ferment produced by these glands, which ferment alters the venous plexus or portions of it, thus permitting an escape of blood, seems possible.

sarily follow. I have seen specimens removed during the interval and prementual period with a very thick and vascular endometrium, and yet the patient gave a history of a moderate menstrual flow; and other specimens removed under similar conditions showed a much thinner endometrium, and yet menstruation was very profuse. The type of menstruation is not entirely dependent upon the character of the endometrium, here again functional activity plays an important part and the degree of this activity cannot always be detected from the anatomical structure.

It is generally considered that under normal conditions the menstrual blood will not clot. In other words, the endometrium receives

It would be expected that the thicker and

the more vascular the endometrium, the

greater the flow, but this does not neces-

conditions the menstrual blood will not clot. In other words, the endometrium receives coagulable blood and it escapes in a noncoagulable state The endometrum is supposed to secrete some substance which inhibits clotting Sturmdoff believes that this is an important local hamatological factor in the causation of uterine bleeding. The discussion of this phase of the subject and references to the literature may be found in his article 2 I obtained careful menstrual histories in regard to clotting from 100 nomen who either were not suffering from any pelvic disorder at the time, or the history applied to the character of their menstruation previous to their pelvic trouble. Sixtyfive gave a history of no clotting; the flow was scanty in 15, moderate in 44, and profuse in 6. Thirty-five gave a history of clotting, the flow was scanty in 2, moderate in 8, and profuse in 25 Of the 100 cases, the menstruation was scanty in 17 (no clotting in 15, and clotting in 2), moderate in 52 (no clotting in 44, and clotting in 8), and profuse in 31 (no clotting in 6, and clotting in 25). It would seem that patients with a scanty or moderate flow were not likely to have clots (59 out of 60), while those with a profuse flow were likeby to (25 out of 31). This is in accord with the findings in the injected specimens; if the flow is profuse the endometrium does not have an opportunity to act upon it and much of

Archev f. Gynak, 1011 Rev 260-313

²N Y.S. J. Med., 1011, N. 2161-64

it is probably a reflux (no valves in the veins) from the rich plexus of the myometrium. While the action of the endometrium on the blood (inhibiting its power to clot) may be an important factor in the onset of the flow, it would seem to me that it may have but very little influence in the causation of proluse menstruation

THE MYOMETRIUM AS A FACTOR IN THE CONTROL OF MENSTRUATION

In considering this we must also include its blood-vescels, and especially the rich venous pietus into which the endometrial venous pietus empties. We are all aware of the fact that contraction of the uterus will cause endometrial harmorrhage to cease, and relaxation of the same will make it more profuse. We have the opportunity to observe this not only postpartum, but also when curetting the uterus especially for an incomplete abortion—the interps will often dilate, leading to a profuse harmorrhage, and the contraction of the utern will cause the bloeding to cease.

of the uterus will cause the bleeding to cease Following curettement of the uterus, the bleeding soon ceases The question naturally presents itself. Why is not the usual curettage for sterility etc. followed by prolonged bleeding simulating the menstrual flow? The endometrium and its blood-vessels have been injured. I have injected only one uterus in which there had been a curettage as the first step in the operation specimen both the arterial and venous injection masses escaped into the uterine cavity, showing that both the arteries and veins of the endometrium, and also possibly some of those of the magnetrium, had been injured, yet had the uterus not been removed the bleeding would soon have ceased study of injected specimens will convince one that contractions of the uterus would easily compress not only the venous channels leading from the endometrium, but also the distal branches of the radial arteries, which supply the endometrium and are very small latter, after being severed, may also retract within the musculature, due to their elasticity. and soon cease to bleed. Contraction of the uterus would also compress the endometrium and make smaller the uterine cavity The

myometrium is apparently an important factor in the control of physiological uterine bleeding.

We have discussed the influence of ovarian activity on the menstrual cycle as manifested in the changes occurring in the endometrium. The study of this phase of the subject is relatively easy, but the study of the changes occurring in the myometrium is more difficult. It is supposed that the uterus contains more blood just prior to the menstrual flow, i. e., it is "congested." I have endeavored to prove this, but there is so much individual variation in the specimens removed that I have been unable to tell, by the appearance of an injected myometrium, at what stage in the menstrual cycle the uterus was removed, just as I have been unable always to determine by the appearance of the endometrium (except during the actual flow) what stage of the menstrual cycle it presents. Nevertheless my studies have led me to believe the venous plexus of the myometrium is capable of containing more blood just before the menstrual flow than at any time, and possibly more blood may be carried by the arteries to the The greater the relaxation of the uterus, the more blood it will contain. We would naturally suppose that the greater "the uterine congestion" the greater the menstrual flow, but this is not invariably The plexus of the myometrium may be greatly dilated, and yet the flow is not necessarily profuse, as may be seen in some of the uteri containing intramural myomata, which are not necessarily associated with proluse menstruation. It is not the amount of blood within the uterus or pelvic veins which determines the amount of blood lost at the menstrual flow as much as the control of this blood, i e, the ability of the uterus to hold back the venous blood A great factor in preventing the escape of this blood into the uterine cavity is the tonicity of the uterus. It would seem that during relaxation of the uterus at the menstrual period the venous blood escapes into the uterine cavity, and during contraction of the uterus the flow is retarded by occlusion of the cavity and compression of both arteries and veins, but the blood which has escaped into the uterine cayity is forced out through the cervix. If the endometrium is intact, bleeding will not occur during relaxation of the myometrium. This may be observed during pregnancy, when the uterus is frequently related, and I have observed it during curettage; the dilatation of the cervix may cause uterine relaxation, as shown by the length of the uterine cavity. and yet bleeding does not occur until the endometrium is injured

My studies have led me to beheve that the myometrium is a very important factor in the regulation of the menstrual flow It may receive stimuli from many outside sources, the most important of which is probably the overs-

As women grow older all the pelvic generative organs become less vascular and less active The arterial system of the uterus becomes physiologically sclerotic, the venous plexuses atrophy, the endometrium becomes thinner and anamic, the museles of the myo metrium atrophy, and the proportion of fibrous tissue increases and the entire organ becomes smaller. Under normal conditions menstruation becomes gradually less and finally ceases. Under abnormal conditions of uterine mefficiency, and here I believe with Theilhaber, that the most important single factor is inuscular insufficiency, menstruation may become prolonged and more profuse, and there may be irregular or intermenstrual bleeding

STREETARY As a result of ovarian activity the uterus of the sexually active woman becomes periodically hyperæmic, the height of hyperremia (congestion) occurring in the premenstrual period. The endometrium undergoes functional active changes, often manifesting themselves by hypertrophy, especially glandular, hyperamia, and cedema onset of menstruation is established by changes in the venous plexus of the endometrium, permitting the blood to escape into the uterine cavity. The continuation of the flow is probably made possible by several factors; such as ovarian activity, the continuation of the uterine conditions which established it, and the time necessary for the regressive changes to occur and repair to take

place. Menstruation then is associated with and followed by a process which may be called involution.

The amount of blood lost is determined by many factors and their interrelation, such as ovarian activity, the anatomical and functional changes in the endometrium and myometrium, and influences other than ovarian outside the uterus. Of all these factors, I believe that the muscular efficiency of the uterine wall must play an important part, for this is the only means of closing the uterine cavity and of controlling the venous channels which unite the plexus of the endometrium with that of the myometrium, and also the arterial blood conveyed to the mucosa. The "protective zone" (anamie) through which the terminal portion of the radial arteries and the venous channels pass would be the portion of the uterus most readily compressed by uterine contraction

THE CLASSIFICATION OF UTERINE MYOMYTA

Myomata may arise in the body of the uterus, the usual situation, or in the cervix. They may be grouped topographically into the intramural, the subserous (including intraligamentary and retrapersioneal), and the submucous (the usual classification) We may also group them according to the source of their main arterial supply, into peripheral and radial A peripheral myoma is one arising in the peripheral zone of the uterus and receiving its chief or sole arterial supply from a peripheral branch of an arcuate artery. All peripheral tumors are either intramural, subserous, intraligamentary, or retroperitoneal A radial myoma arises in the radial zone and receives its chief or sole arterial supply from a radial branch or branches of an arcuate artery. All radial tumors are primarily intramural They may persist as such, or eventually become subserous or submucous When they do so they carry their nutrient artery or arteries with them.

These tumors may also differ morphologically A myoma may be simple, that is uninodular, or compound. In the latter case it may be referred to as conglomerate or multinodular. It may be discrete, with sharply defined limits, or diffuse, merging gradually into the surrounding tissues. We must also consider a somewhat unusual form, the adenomyoma, in which areas of uterine mucosa are found.

In studying the influence of myomata on the circulation of the uterus, we must consider in each case the variety of myoma or myomata present, their blood supply, the age of the patient, and if before the menopause at what stage of the menstrual cycle the uterus was removed. It is often difficult to study the influence of each variety on the blood supply of the uterus, because usually several myomata are present in each specimen, and often representing several varieties.

In the 150 uteri containing myomata, multiple tumors were found in 144. The following classification of this material may be made

Small peripheral myomata projecting from the surface of the uterus, which may be desig nated as subserous, were encountered in 83 specimens. In only one specimen was only one myoma found, in all the others intramural tumors were also present.

Large pedunculated myomata 10 cm in diameter (the largest being 22 cm) were en countered in only three specimens, and these were all associated with intramural myomata.

Small intramural myomata, either peripheral or radial, were found in 146 of the uteri removed, and in only two instances was only one tumor present

Medium size (25 cm or over) and large intramural myomata were found in 76 specimens, and in three only was a single tumor present

Submucous myomata (i e, over half the circumference of the tumor projecting into the uterine cavity) were found in 16, and all were associated with other varieties of myomata

Adenomyomata were found in 12, and all were associated with other varieties

Only one definite cervical myoma was found, but two others were encountered while I was collecting this material, but were not injected, as the tumors were removed without removing the uterus.

THE BLOOD SUPPLY OF UTERINE MYOMATA All myomata, except some of the very small ones, have an arterial blood supply which can be easily seen with the naked eye. As they increase in size they become more vascular (arterial), so that the medium size and large ones contain more vessels filled with the arterial injection mass than the myometrium. The vessels filled with the venous injection mass are usually few in numbers and in some specimens, even large tumors. I have been unable to demonstrate any "veins" in the substance of the tumor This is in marked contrast to the my ometrum, where the venous supply predominates over the arterial

The arterial blood is carried to these tumors by means of nutrient arteries which are either peripheral or radial branches of an arcuate artery, hence myomata may be grouped as either peripheral or radial. In many only one nutrient artery is found; in others two or three, with one predominating The branches of the nutrient artery extend over the surface of the tumor and penetrate its substance thus supplying the intrinsic "arteries" of the tumor, which I have stated are often much more abundant than those in the myometrium and differ in their arrangement, etc (See previous article on the blood supply of uterine myomata) Often the only communication found between the arteries of the tumor and those of the myometrium is by the nutrient arteries some of the medium size and large tumors. in addition to the nutrient arteries, an anastomosis was found between the arterioles of the myometrium about the tumor and similar vessels in the periphery of the myoma. When the tumors change their position their nutrient artery accompanies them. In many of the medium size and larger myomata the development of their intrinsic arteries is so great that the injected specimen appears as an arterial angioma rather than a myoma.

The myomata, as already stated, are usually poorly supplied with veins in their substance, and in some specimens I have not been able to demonstrate any. I have proven in some, that the arterial blood gains access to veins in the substance of the tumor, i.e., where the latter are present; but where veins

cannot be demonstrated we must assume that this occurs about the periphery of the tumor, or else the arterial blood leaves the tumor as such and gains access to veins in the surrounding myometrium. The enormous number of arteries in the tumor and their tortuous course, together with the apparent inefficient venous outlet, suggest that the circulation of the blood within the tumor is sluggish. For further description of the blood supply of these tumors, see previous article on the subject. On account of the great vascularity of many of these tumors, we must look for other changes in the circulation of the uterus than those caused by the mechanical influence of the tumor or tumors.

SMALL SUBSEROUS MYOMATA

Changes Caused by Them in the Circulation of the Uterus

I have included in this group all myomata under 2 5 cm. in diameter projecting from the surface of the uterus for over one half their circumference, and that covered only by peritoneum. As stated, this variety was found in 83 specimens, and in only one specimen was but one myoma present. In all the others intramural myomata were found. A study of the injected specimens shows that the branches of the nutrient artery of the tumor spread over the surface of the tumor from its base, and thence penetrate the substance of the tumor. The tumors of this size, while containing intrinsic atteries, are usually less vascular than the myometrium. Veins are found over the surface of the myoma, but it is usually impossible to demonstrate any within its substance Aside from a slight increase in size of the peripheral artery from which the nutrient artery arises there is not any apparent change in the arteries of the uterus, and the same is true of the veins. The study of the injected specimens supports the elinical findings in these cases, i. e , small subserous myomata do not disturb the circulation of the uterus and do not alter menstruation. The same was found to be true of the medium size subserous myomata (2 5 to 10 cm in diameter), of which 11 were studied

LARGE SUBSEROUS MYOMATA (OVER 10 CM. IN DIAMETER)

Changes Caused by Them in the Circulation of

Only three such specimens were present in this series: one was associated with several intramural myomata, small and large, and a submucous myoma, and therefore was not adapted to the study of this phase of the subject. The other two also contained several intramural and subserous myomata, but fortunately they were of small size. In one of these two the subserous tumor was to emin diameter, very vascular, and derived its chief blood supply from one uterine artery (Fig. 9). This artery was enlarged, and it could be seen in the radiograph that the excess blood supply over the normal was diverted from the uterus to the tumor. The body of the uterus was not enlarged, the artenal supply was not increased, but rather appeared less than normal, suggesting that the tumor might receive more than its share of arterial blood. Large veins were present in the pedicle of the tumor, and the venous blood was carried from the tumor by means of large venous channels in the peripheral zone of the uterus (Fig 10). From a study of the specimen one would suppose that the tumor would not influence menstruation, and such was the history of the case - menstruation regular, normal, and moderate. The second specimen was larger, the tumor, measuring 22 cm in diameter, arose from the middle of the posterior wall of the uterus, and was therefore nourished by both uterine arteries uterine arteries were greatly enlarged, and what has been said about the previous specimen can also be said about this one (Figs 7 and 8). Menstruation in this patient had always been profuse but had not increased in amount or duration. These two cases show that while these tumors alter the arteries from which their nutrient arteries arise, and give rise to large venous channels in the pedicle of the tumor and in the peripheral zone of the uterus, the radial zone is unaffected, and we would expect that menstruation would usually not be altered; and such has been our clinical experience



lig : Radiograph of the arrieral aupily of the entire uterus \(\); Aulipiara aged 15, arteries injected by the birmuth subcarbonate autops greatmen. The course of each uterine arrier 15 shown along the side of the uterus and from these the intrinsic uterion caracitate arrier arrier.

Some of the large venous channels in the pedicle of the tumor are very superficial, and similar channels are found about the base of the tumor. One can readily see that these might easily be injured by movements of the tumor and give rise to bleeding into the peritoneal casity. Such a complication occurred in this series, the injury arising from a binanual examination of the patient made before the operation.

SMALL INTRAMURAL MYOMATA (UNDER 2 5 CM IN DIAMETER)

Changes Caused by Them in the Circulation of the Uterus

As has been stated under the classification of uternic myomata, these were found in 146 of the 150 specimens, and only in two instances was only one tumor present. They



The a Arternal supply of the uterine tissues. N i Radiograph of 1 consisting 1 mm thick of the body of she afecus. Nullipara, aged 14, arteries injected with bestruth uterus removed for chronic palvic perstonitis The create arteries the large arteries and a small portion of 1 third two of which appear in the illustration Diss In tween the outer third and inner two thirds of the uterine wall and terminate, in the mode in line in caded and purish eral tranches. They divide the uterine will into two zones -the outer or perspheral zone which is nourished by peripheral branches of the arcuste orteries and the inner or radial zone, which is nownshed by radial branches the later terminating in the endometroim by fine capillaries Each arcuste arters, with its peripheral and radial brambes supplies a quadrantal segment of the uterus corresponding to the anterior or posterior half of the Mullertin duct of that side. When the uterus is relaxed arrenal blood would easily gain at cess to the entiometrium but when contracted it would seem that the terminal arterioles and capillaties of the radial arteries would be early compressed

were present in all but three specimens where medium size and large intramural myomata were found in all specimens containing submucous myomata adenomyomata, and medium size and large subscrous myomata. This group alone was found in uteri which were removed for the following conditions: pelvic inflammation, 14, including two cases of puerperal infection with portions of retained placenta, uterine bleeding, 16, ovarian cysts, 7, carcinoma of the cervix, 7, carcinoma of the body, 5; retrodisplacements and prolapse, 5 (uterus removed on account of myomata discovered at operation), ectopic pregnancy 3, sarcoma and hydatiform mole. each one These tumors develop either in the peripheral or radial zone of the uterus. and are either peripheral or radial tumors. I have not counted all the tumors found in the 146 specimens, and so cannot state in which zone they occur most frequently, but apparently in the radial zone, and this would be expected, as it is much the larger zone



Fig 3 Venous supply of the uterine tissues X I Radiograph of a cross slice of the body of the uterus as shown in Fig 2 Nullipara, aged 30, veins injected with bismuth through the utering and ovarian veins. Uterus removed for chronic pelvic peritonitis during the interval stage of the menstrual eyele. There is a rich venous plexus of the endometrium, and also of the myometrium, which communicate with each other by channels which pass through a relatively animie zone Collecting veins are present about the periphery of the magnetnum, especially at the sides (and, at times, accompanying the arcuate arteries), which convey the venous blood to the uterine and ovarian veins. Valves are not present, and therefore when the uterus is relaxed the venous blood in the myometrium could easily be forced back into the plexus of the endometrium, and if the latter was injured (physiologically or otherwise) it would escape into the uterme cavity Contraction of the uterus would make the uterme cavity smaller, compress the endometrium, and force the venous blood of the latter into the my ometrium and thus prevent bleeding into the uterine cavity. This is in accord with clinical observations



Fig. 4. Venous supply, of the uternat tassets: Close of menstratation X. 1. Radiograph of a cross side of the body of the uterus, as in Ing. 3. Nullspara, aged as, wenn injected with businest. Determined, at the close of manning control of the close of the uternate cavity accept during the menstratal flow or just before or just afterwards—showing that changes in the uternate cavity accept during the menstratal flow or just before or just afterwards—showing that changes in the uternate cavity at the time, but always the venous, and never the latter energy at the show menstrated time. This demonstrates that the menstratal flow is mantly, of not entirely second. We a sould supple this from the sately one of the control of the control



Fig. 5 Venous supply of the codometrum. Close of mentivation N. 4. Finiterement (N. 4) of a portion of the radiograph shown in fig. 4. The mentival flow stress from the senous pfears of the endometrum and eccepter either into the basies of the latter, forming a benations, and there can to the utilities evidence of the control the control through the control throug



Fig 6 Venous supply of the endometrium Interval stage of the meastrual cycle X 4 Enlargement (X 4) of a portion of the radiograph shown in Fig 3, to be compared with Fig 5, showing meastruating endometrium

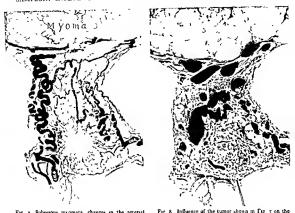


Fig 7 Subserous myomata, changes in the arterial circulation of the uterus. Slightly reduced in size. Radiograph of a cross slice, I cm thick, of the body of the uterus and a portion of a large subserous myoma with its pedicle. Nullipara, aged 31, arteries injected with its pedicle Nullipara, aged 31, arteries injustion bismuth. The uterus contains several small subserous tumor (22 cm in diameter), arose from the posterior wall of the uterus a little to one side of the median line, and has a nch arterial supply A small subscrous myoma, a 3 cm in diameter, is attached to the anterior interine wall. Its nutrient vessels are small and have very little influence on the arterial circulation of the uterus. The maio nutrient artery of the larger tumor, a peripheral branch of an arcuate artery, together with the latter, is greatly enlarged The arcuste artery of the opposite side, which anastomoses with it, is also enlarged. The greater portion of the blood stream from the uterine arteries, especially the one from which the chief nutrient artery arises, is diverted from the uterus to the tumor The radial arteries of uterus are apparently not increased in size and numbers

these tumors apparently have an arterial blood supply, although I have seen a few very small ones in which it could not be detected in the gross specimen, this may have been due to faulty technique or the section through the tumor may not have exposed any of its vessels. Its nutrient artery, a radial or peripheral branch of an arcuate artery, sur-

venous creciation of the uterus (menstratation normal but profuse) Photograph of the slee shown in Fig 7, venus ispected with ultramanine blue. The white does are arctered, contament burnatil, which have been cut across critical and the proposed of the tumer and in the perspheral some of the uterus near the pechde. The radual some is but little affected. The endomentum is the helend. A portion of the venus please of the propheral some of the uterus across the propheral some of the uterus across conjugation. The "weeks conjugation of the propheral some of the boroad ligarant. The "weeks conjugation" is apparently active, and, bump mankly in the perspheral some, after very hitch the circulation of the endomentum is missing the propheral some of the same that the circulation of the endomentum. Menstrauton in this patient hadder by prophera, encre extensive, and no increased hadder by prophera size, afterway, and the critical and the prophera size, afterway, and increased hadder are considered in the case of the consideration.

rounds the tumor with its branches, and the latter penetrate the substance of the tumor. Intramural myomata of this size are nearly always less vascular (arterial) than the surrounding myometrium. I have usually been unable to find any vessels in their substance falled with the venous injection miss. These tumors apparently do not appreciably after the arterial circulation of the uterus as a whole unless in large numbers, when the uterine unless in large numbers, when the



Fig. 6. Large subserous myoma. Changes in the atternal circulation of the uterus. X t. Radiograph of one half of the uterus (sagittal section), and of the lower portion of the tumor and its pedicle, arteries injected with bismuth Xullipara, aged 45.

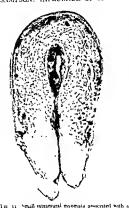
The tumor, to cm in diameter (the lower portion is shown) arose from posterior aid of the fundate to one side of the inedian line. A small sub-cross summer is situated just below it. The larger tumor is very vascular, and its outroit arrey arises from one uterine arrey which is larger! han normal, and the greater portion of its blood stream is directed from the uterus to the tumor.

artery may appear a little larger Locally the artery supplying its nutrient artery may seem a little larger, and mechanically they displace the arteries in the surrounding myometrium. The venous plexus of the myometrium about the very small tumors is not appreciably changed, but about many of those over 1 em in diameter there is often a localized, or even a general dilatation of this plexus, and this mereases with the size of the tumor. Sometimes when the larger tumors of this group are present or there are a number of tumors, there is an increase in the size of the uterine wall, due in some instances to an actual hypertrophy of the maometrium and in others to a dilatation of the venous plexus of the myometrium, or both factors (Fig 13).



Fig. 10 Influence of the tumor shown in Fig. 9, on the tenous circulation of the uterus (menstruation normal moderate) I'hotograph of a sagittal section of the specimen, veins injected with ultramarine blue dots are attenes, containing bismuth, which have been cut across Uterus removed during the interval stage of the menstrual cycle. Note the dilated veins and sinuses in the pedicle of the tumor and the upper portion of the peripheral zone of the uterus. The radial zone is but little affected, the endometrum (a small portion shown in the section) as apparently unaltered. A portion of the venous plexus of the peripheral zone of the uterus is converted into venous channels for conveying the venous blood of the tumor to the ulerme and ovarian veins. The "venous congestion" is evidently active, not passive, and did not after the curculation of the endometrium, I e, the uterus was able to control its venous circulation. Mensimation m this patient had always been normal and moderate in Amount

A study of the injected specimens suggests that these tumors usually do not greatly interfere with the circulation of the uterus and do not alter menstruation, and elinically experience confirms this Even those with a generally hypertophied venous plexus of the myometrium do not necessarily have menstrual disturbances (Fig 13). On the other hand they may induredly cause menorrhagia or metrorrhagia (Figs 11 and 12). In 18 uteri



polypsid condition of the endometrium (minorrhagia) A 1 Photograph of a sagittal section of the uterus Para aged 40, hysterectomy for uncontrollable uterine bleeding (drugs and curettage had failed to relieve the pattern). patient bleeding slightly at the time of the operation Arreges injected with Venetian red and veins with ultramarine blue. The arterial injection mass did not escape into the uterine casity but some of the senous mass did and appeared as an oozing from the surface of the endo metrum. The uterus is slightly inlarged and contains several small intramural myomata shields in the peripheral zine one (M) shown in the illustration. The endometrium to hypertrophied and presented an agregular polypoid sur-The venous pleaus of the my ametrium is not hyper trophied. While small intramural myomata apparently do not alter the circulation of the uterus in the majority of cases, they may possibly sometimes cause changes leading to abnormal bleeding one of which may be a polypoid condition of the endometrum Compare with the next disstration

removed for obscure uterine bleeding, small intramural myomata were found in 16. The two in which they were not found were nulli para as were also two of the 16. In 4 of the fo, discrete polypi were found in addition to the myomata, in two others there was a polypoid condition of the endometrum. In the remaining ten, the myomata were the only apparent nathological condition present



atrophied endometrium (menorrhagia) A 1 graph of a sagnital section of the uterus Para, aged 41. hysterectomy for uncontrollable uterine bleeding (drugs and curettage hul laiked to relieve the patient), patient bleeding at the time of the operation Arteries injected with Venetian fed and veins with ultramarine blue. The arterial injection mass did not escape into the uterine LANDS but some of the venous mass did, and appeared as an oozing from the atrophic rough endometrium. The uterus is slightly enlarged and contains several small intramural myomata two shown in the illustration. The endometrium is atrophied and rough The uterine cavity is not closed. The venous plexus of the myometrium is not dilated. A condition of uterine inclinency exists. The uterus is unable to prevent the venous blood from escaping into the uterine casity 5mall intramural myomata may possibly cause this condition. The atrophied rough endometrium may be but a stage in the abnormal menstrual cycle, the other stage being represcated by a polypoid condition of the endometrium, as shown in the preceding illustration

list 12 >mail intramural myomata associated with an

In none of the 16 cases did any of the my omata encroach upon the endometrium. In two of the specimens the uterus was soft, flabby and the plexus of the myometrium hypertrophied,



Uig 1.5 Small perspheral internumal majoristic Changes in the versus recruition of the sterein structure, normal and molerater X t. Radioscaph of a median scriptial dies in mit held, of the actions and the nymon. User a stress of the stress is considered to the stress and the nymon term of the stress of the s

in the others the uterus was hard the walls, thickened, and the pleus of the myometrium compressed. They represent the two types of uteri associated with abnormal bleeding described by Theilhaber! the one due to muscular weakness i.e., the musculature is unable to regulate an increased hyperamia due to any cause, or hypoplassa muscularis uteri, the other due to an apparent predominance of librous tissue, the myoffbrassa uteri found especially in parous women approaching the menopause. It is not my purpose to discuss the cause of bleeding in these cases,

Blutungen und Ausfluss aus dem Lterus Verlag von E. Rhelabardt München 2009



I to 14 Large jerupheral intramural invoma, its mitomeroe on the arteral circulation of the uterus form streatons, normal and moderate). Slejbily reduced in streatons, normal and moderate). Slejbily reduced in of the uterus and the myons. Audignate, and 54, interest specied with bornath. The tumor, 10 g mm int born dimeter, assess in the perspheral none of the anterior dimeter, assess in the perspheral none of the anterior uterior activity and the tumor is enlarged and the cure access once the normal is discreted to the tumor, shall not expressive and the care and the cure access once the normal is discreted to the tumor, and the cure access once the normal is discreted to the tumor as the cure of the uterus and the enfoliations in the side there is no customer of the uterus and the enfoliations between the attrict on the time of the tumor was allowed to the tumor was the country and the constraints.

as the literature on this subject is voluminous, contributions having been made by several writers in this country, as Findley, Anspach, Smith, Goodall, and others, but to suggest



the venous supply of the uterus. Photograph of the shee shoon in Fig. 13, venos spected with ultramarine blue, uterus removed during the interval stage of the mentage of the properties of the properties of the properties of the venous period in the peripheral science where portions of the venous period in the properties of the venous blood from the turnit, as in Figs. 8 and 10. The endometrism is hypertically and the properties of the properties of the turnity as in Figs. 8 and 10. The endometrism is hypertically and the properties of the properties of the turnity of the properties of the properties of the unreased arternal and venous blood supply and prevent is necessarily of venous blood supply and prevent as evenested from C venous blood in the uternae cavity

that small intramural myomata may in some way contribute to its development. From

1 ig 10 Upper surface of the landus of the aterus and the myoma shown in preceding illustration. Photograph showing the dilated veins over the surface of the tumor which convey the blood from the tumor to the venous channels shown in Fig. 14. These veins are sometimes fujured or become croded and intrapersioneal hemorrhage occurs, as has been reported in the literature.

the study of the injected specimens, muscular inefficiency seems to me to be the most important factor, as it would fail to prevent the reflux of blood from the plexus of the myometrium into that of the endometrium and would fail to occlude the uterine cavity.



Fig. 17 Dilutation of venous plexus of the myometerum about an intramigal myom; Slightly reduced in size Radiograph of a cross slice 3 mm that through the fundus of the uterus and myome above the uterine easity Veins injected with losmuth, para, aged 28 There is a marked dilatation of the venous pleans of the magnetium

MEDICAL SETT AND EARGE INTRAMERAL MAG-Changes Caused by Them in the Carculation of

the Uterus Medium size and large intramural myomata were found in 76 specimens, in 60 of these they were the principal variety present, while in 16 a more important variety or condition was associated with them, as submucous myomata in 11 adenomyoma in 3. sarcuma in 1, and carcinoma of the cervix in another Sixty of these specimens were used in the study of this phase of the subject. In a only one tumor was found, while in 57 multiple intramural myomata were present

These specimens have been arranged in three groups. Those not encroaching upon the uterine

- cavity Where a single tumor encroaches upon
- the uterine cavity Where multiple tumors encroach upon
- the uterine cavity Medium size and large intramural myomata not encroaching upon the uterine cauty -These were found in many of the specimens. but only in 6 were they the principal condition present, and in all 6 other smaller tumors

were present. They develop in the peripheral zone of the uterus, and are nourished by peripheral arteries which supply the tumor



Fig. 18 Dilutation of senous plesus of maintenum and endometrum Same syncimen shown in the preced pe illustration (menorrhagia) Radiograph of a cross slice. mm that, through the lock of the uterus below the Clerus removed in the interval stage of the menstrusl eyele. There is a general venous active hyperarmia, with dilutation of the venous plexuses of the myomefrom and endometroum, apparently caused by the myoma The hypertrophied endometrium may be caused by this hyperamia. Menetruation had become much more profuse for four months prior to operation, i.e., the uterus was unable to control this hyperemia, and an excesse amount of senous bland escaped during the menstrual

as the smaller tumors are nourished. There is usually one principal nutrient artery, and secondary ones may be present which communicate with branches of the principal one: in addition there is sometimes found a communication between atterioles in the periphery of the tumor and those in the surrounding myometrium, as has been described in the previous article The venous supply of these tumors is usually scanty, and in some ap-Tumors of this size contain parently lacking a larger number of arteries than the surrounding myometrium and sometimes are so vascular that they appear as an arterial angioma rather than a myoma (fig. 14).

A study of the injected specimens shows that these tumors contain many tortuous vessels tilled with arterial blood and that the veins within the tumor are usually scanty (Fig 15), this suggests that the circulation of the tumors is very sluggish Nevertheless, there is a demand for more blood to be carried to and away from the uterus, and therefore the extrinsic uterine arteries and veins are usually increased in size. One uterine artery is sometimes larger than the other, namely, the one nourishing the largest myoma or the greatest number. The arcuate attery from



Fig. 10. Large radial intramural myoma, changes in the arterial circulation of the uterus A s Radiograph of a sagittal slice, 5 mm thick, of the body of the uterus and portion of the myoma Para, aged 49, artenes injected with bismuth The tumor, to cm in diameter arose in the radial zone of the posterior uterme wall and caused a symmetrical enlargement of the uterus arteries, not shown in this slice were enlarged and more blood was carried to the uterus and tumor, but the excess over the normal was carried to the tumor through its nutrient arteries. In addition there is a communication between arterioles in the persphery of the tumor and those in the surrounding myometrium. The tumor apparently has had very little influence on the arterial supply of the uterus, except that the tadial arteries supplying the endometrium nearest the tumor have to curve around the tumor to reach it. The diminution of the arterial supply of the uterine tissues is possibly due to the age of the patient - 49 years

which the principal nutrient artery arises is also increased in size As in large subserous myomata, the excess arterial supply of the uterus as a whole is diverted to the tumor or tumors The tumor mechanically causes a displacement of the arteries in the surrounding myometrium. The myometrial venous

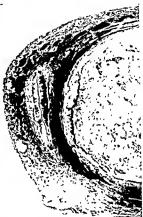


Fig. 20 Influence of the my oma shown in the preceding illustration on the venous circulation of the uterus (menstruction normal and moderate) l'hotograph of the surface of the sine shown in the preceding illustration, sems injected with ultramarine blue, uterus removed during the interval stage of menstrual cycle. The myoma has caused an enlargement of the aterus, a e a hyper trophy of the walls and dilatation of the venous plexus, especially about the periphery of the tumor and between and the portion nearest the latter is hypertrophied, more cascular (cenous) than the rest of the endometrium In space of the hypertrophy and increased vascularity of this portion of the endometrium (venous congestion), and the dilated venous plerus between it and the myoma, menstruction had always been normal and moderate in amount The uterus was able to control this venous con gestion and prevent an excessive flow of venous blood at the menstrual period

plexus about the tumor is always dilated, As the latter condition exists about the entire circumference of the tumor, it is principally one of active and not passive venous hyper-A study of the six cases shows that the disturbance in circulation is chiefly a local one, and in four of the six specimens it



Fig. 26. Large radual intrinsural myonus mensurasing endometrium (menorrhisasia). Ny 56. Radiograph of a cross after of the uterus. Nullpara, aged §5, sons injected with beauth, uterus removed the first day of the men and attophied while that lateral to the tumor and not outprised by it is hypertrophed, the uterus castly opposite the latter (X and X) is illied with the injection of the compression of the superficiel portion in a version with the superficiel portion of the version with the superficiel portion in a version with the superficiel portion in a version with the superficiel portion of the version with the superficiel portion in the superficiel portion of the superficiel portion in the superficiel portion of the superficiel portion in the superficiel portion of the superficiel po

a zone of myometrium. We find in the radiographs that the radial artenes curve around the tumor, and while distorted in their course are still able to reach the endometrium lining the cavity nearest the tumor. The venous pleums of the myometrium between the endometrium and tumor is usually dilated. The uterine cavity is usually broadened or lengthened, or both. The endometrium nearest the tumor is sometimes thickned and other times thinned. The latter condition may be due to pressure or interference with its blood supply. Conditions found in some of the injected specimens would seem to support the theory advanced.

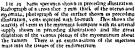


ler at Two large radial intramural myomata, men structing endometrium (menstruction slightly increased in amount) Slightly reduced in size l'hotograph of a cross section of the uterus and my omata. Aullipara aged 32, arteries injected with ultramarine blue and veins with bismuth, uterus remined the first day of the mentional flow A large my oma is utuated in the radial zone of each whetine wall. The my omata have a very rich arterial blood supply (black) The venous pletus of the myometnum (white) is chinied especially about the miomata The endometrium (half way between the myomata) is hypertrophied (its blood supply is not interfered with) and there is an extravasation of the venous injection miss Menstruation had recently (white) into its tissues become slightly more profuse and prolonged, a e, thr uterus was beginning to be unable to prevent an excessir flow of senous blood into the uterine casity during the menstrual flow

by Clark, viz, that such tumors mechanically compress the veins more readily than the arteries, and therefore cause a local congestion of the stephen such that the such t

Fig. 27. (See Institutive?) The large model intransual insumata approaching the uterine reality (inenstration moderate). X. Colored photograph of a median aspital section of the uters as not myomata. Nalityria, aged 17, arteres imported with ventual red and vense with obteniance blue, uters removed in the interval vage of the memorial operation of the control of t





tion of the portion of the endometrium over the tumor, and hence menorrhagia results but the history of these cases do not entirely support this view. While menorrhagia occurs in some of them, menstruation in others is normal (Fig. 20), and menorrhagia is much less apt to occur in this group than in the one about to be described, where the portion of the tumor encroaching upon the uterine cavity is covered only by the endometrium. and that portion of the endometrium is an emic While the local congestion, when it is present may be a contributory factor in making the menstrual flow more profuse, it is not the chief one, and we are forced to explain the bleeding when it occurs in this group as being due mainly to a condi-



Tig to I rom same specimen shown in the two preterling illustrations. Radiograph of the upper size of the specimen, showing the dilated sensors channels of the myometrium spread over the upper surface of each tumor

tion of uterine inefliciency The uterus is unable to control the great venous hyperæmia which exists and prevent an excessive flow of vengus blood at that time We find identical anatomical conditions in two specimens. 1 e, great venous hyperamia of both myometrum and endometrium, and especially marked between the tumor and the uterine cavity, yet in one the menstruation is unaltered and in the other menorrhagia or metrorrhagia exists. In 8 specimens where the tumor was separated from the endometrium by a zone of myometrium, only three gave a history of menorrhagia

The next group, where the tumor encroaches more upon the uterine cavity, represents a later stage of the preceding one and included 36 specimens. In this group the myoma is separated from the uterine cavity by a thin capsule of myometrium or the endometrium alone. I have included in this group all



fig. 3: The influence of a medjum size rad a instancial mustar on the arterial supply of the endometrium more it "highly reduced in size. Rashegraph of a cross-loca ann thick of the fundus of the utilities on language and the size of the size of

was confined mainly to the peripheral zone of the uterus and the circulation of the radial zone and endometrium was unaftered. The uteri apart from the tumors were only slightly increased in size. We would expect that in these four cases menstruation would not be affected by the tumor or tumors, and it was In two patients menstruation had apnatently been altered by the myomata. In one it had become more profuse, many medium size intramural nijomata were present in the peripheral zone of the uteru- and the-e may have mechanically embarrassed the flow of blood from the radial zone, the uterus as a whole was increased in size. Here again muscular inefficiency may have been at fault, i.e., more blood in the radial zone than the musculature of the uterus could The other patient had both menorrhagia and metrorrhagia, and the specimen



14.2.1 Latze railed intramutal myons, mestiqued and-menturing (mentraligial) X. J. Protectiph of sense section of the uterus. Vullipara, aged 42, shorter meeted with Vinetura red and sens with ultramate Race, others removed the second day of the mentaline of the protection of the second day of the mentaline of the second hyper the second day of the mentaline of the second hyper the uterus easily. The streng upstates may seed that of except the uterus carrier, but the venues mass did. The cervit was raimed protect the spection of the venues may, therefore the uterus carrier, to discended with this mass. For further details see next disquestions

apart from the myoma was typical of myo-

Sincle medium size or large intromused todaids) meants which encounts who have the specimens as the principal condition prest less were found in 44 specimens as the principal condition prest less were overshadowed by some other condition, as a submucous myoma, sartoma, carcinoma. etc. In three of the 44 specimens only one, myoma was present. In the remaining 41 other but less important myomata were found. These tumers had all they cloped in the radial.

Fig. 2. (See feati-ynece.) Large robols meanmaid myour enchaching upon the obtaine Gaits (menorhapsi). Yi. Colored photograph of a lateral apertial extent of the steros and myons. Auflusta seed 40, surers injected with Venetian red and seens with ultramanuse blee, uterus removed in the interval stage of the mention cycle. The myons as situated in the robol asso of the posterior attent with and his valued a symmetric enlargement of the body of the uterus. The uterine walls are hypotrophical and their visions place distributions for the timor reacrosches upon the uterus Carlos and the endometrium over it and opposite it is across the other hand the endometrium not encrosched upon, other directly of indirectly. In hypotrophical, it is not first on the and produced, it is, the strays was waable, in this care, to control its increased associative, and person and optioned, it is, the strays was waable, in this care, to control its increased associative, and person and optioned, it is, the stray was waable, in this care, to control its increased associative, and person in case of the patient was not forming it the time of the operation mixed the patient was not forming the time of the operation.



Fig 24 Mentiruating endometrium X 4 From photograph shown in preceding illustration Enlargement X4 of a portion of the uterine early and surround in tunes. The excity is related with the venous injection mass, cervix clamped Albernational permitting the companies of the control of the control of the control of the control of the venous injection mass and the uterine cavity. The glands of the endometrium are easily discernible

zone and were all nourished by radial arteries Their blood supply and circulation are similar to those developing in the peripheral zone They are intrauterine growths in the true sense of the term The body of the uterus as a whole is hypertrophied The degree of uterine hypertrophy apparently varies great ly in different specimens and seems more marked in the relatively young women. In those at or past the menopause it is apparently not as evident The increased thickness of the wall is due principally to two conditions first, an actual hypertrophy of its tissues, and secondly a dilatation of the venous plexus of the entire myometrium, most marked where the pressure is least arterial supply of the entire uterus is increased, and much of the excess over the normal is diverted to the tumor or tumors uterine veins are also enlarged The tumors cause a local displacement of the arteries in the surrounding my ometrium, and the venous plexus of the myometrium immediately about the tumor is often dilated. As these tumors approach the uterine cavity they alter its



Fig. 28. Radial intramural myoma menstrustumic and concentum (uncontrabage). X: I Photograph of a median sagnital section of the uterus. Para, aged 41, atteres injected with ultramarun blue and venue with himmulh, uterus removed the first day of the menstrual flow. The myotes, c cm in dimarter, in stuaded in the upon the uterus exavity. The endometrium over the tumor and directly opposite it is atrophard and anaemic The endometrium not encreached upon to vascular, and the menstrand flow arross: from this, as shown by the extravastion of the bismular (white) into the tissues of Menstrustion was very profuse and prodonged, i. e., the uterus was unable to prevent an excessive flow of venous blood in the uterus cavity.

size and shape and usually make it larger, but may occasionally make it smaller, as when a moderate size tumor develops in the fundus or lateral wall of the uterus.

Let us first consider uteri containing tumors which, while encroaching upon the uterine cavity, are still separated from it by



Fig. 3: Multiple radial interneuts myomals encoush in guon the uterine castly attentia stopp of endometrium (meastrutton recently more product). X-3. Radiometrium captal since in mit their of the uteris. Para seed 43, attents insected with red had. The article and the colour captal size is a stephel and an inner the myomata post to one side and intercept the radial attention when the myomata post to one side and intercept the radial attention when the moderation of the colour captal size is a post of the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size is a size in the captal size in the captal size in the captal size is a size in the captal size in the captal size in the capt

those in which less than one half the circumference of the tumor projected into the cavity. When more than this occurred they were included with the submucous tumors. The vascular changes in the myometrium are the same as in the preceding group, except for the thin zone which is sometimes present between the tumor and the endometrium. This zone in the preceding group was richly supplied with venous blood, while in the present group it is usually amenic. The endometrium over the tumor is also thin and anemic. The radiographs of specimens when the arteries are injected with bismuth show that the tumor mechanically interferes with



Fig. 33. Atterful supply of hypertrophical endometrum, not encroached upon by myomata. Same specimen is the preceding. A 32. Rodingraph of a lateral supplication, a mm, thick lateral lateral to the myomata shown in the preceding dilustration. The endometrum is hypertrophical, its arteral supply is not only not interlered with list to appreciately uncreased in amount.

the arterial supply of this portion of the endometrium (l'ig 21) The radiographs of specimens where the veins are injected show that this portion of the endometrium is also poorly supplied with veins (Fig. 22, see frontispiece), the rich venous plexus of the endometrium having disappeared and being replaced by a time network of veins. Here and there a large vein may be present, just as we find large veins extending over the surface of a subscrous tumor Histologically 1 the glands are few in number, atrophied or en tirely lacking. In extreme cases the endometrium covering the tumor is similar in its vascularity to the peritoneum covering the subscrous variety

The vascularity of the endometrium of the uterine wall opposite the tumor varies according to the size of the tumor and changes in form of the uterine cavity. When the tumor

*Beautifully shown on the illustrations in Kelly and Callen a book Myomata of the Literus, W. B. Saunders & Co. 1999



Fig. 33. Multiple radial intranumal myomatia encrosely more upon the uterine cavity (manorhagi) X-yi. Radorum) of a cross silee, 4 mm theek, of the uterus and myomatia. Nulliparis, aged 27, sens, najected such baseline and the sile of the constraint of the constra

is small, the opposite wall and its vascularity are very little changed. In large tumors, with a corresponding increase in size of the uterine cavity, the uterine wall opposite the tumor is thinned, the course of the radial arteries in this portion of the wall are more oblique than normal, and they are also separated further from each other. The venous plexus of the myometrium where pressure is greatest is compressed. The endometrium covering this portion of the uterine wall is often thinner than usual and anæmic The thinning of this portion of the endometrium, I believe, is due not only to mechanical pressure and a pulling out of the uterine wall, but also to an interception of its blood supply.

Now let us consider the portions of the endometrium not encroached upon by the tumor. The situation of these portions varies

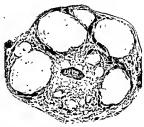


Fig. 24. Multiple radial intramural myomatic beigh othercrampis). N.§ Photograph of a cross section of the uterus. Nullipara, aged 46, vens injected with uterus being radiates in with ventilar per distribution of the uterus. So with the proposed at the menopause. Slight irregular bleeding has present at the time of the operation. Cervar clamped before operating the vinnous as and of being and present operating the vinnous as and of the properties of the myomatic per section of the source per section of the myometrium, especially about the large myomatic, is shown almay small myomata are attuated in the gridal zone about the uterus cavity. The endomentum everywhere was arobae (menopause). The last regular mensitual flow occurred are months before the operation, mensituation regular "specificity" ances the menopause. The injection mass escaped from the atrophicel endometrum, i.e. the uterus was unable to control fits venous creditation.

with the situation and size of the tumor. Take as an example a tumor 5 cm in diameter situated in the center of the posterior wall of the uterus We find that the endometrium is thickest above and below the tumor and at the sides The arterial supply of these portions is not interfered with, and the venous plexus is usually greatly hypertrophied. The blood supply of the endometrium covering these portions of the myometrium is not only not diminished but often apparently is increased; the radial arteries supplying it are sometimes apparently larger and even more numerous. The endometrium is always thicker than elsewhere in the specimen. In the majority of the cases it is thicker than normal, and sometimes there is marked hypertrophy. It was found hypertrophied in 24 of the 36 specimens. In the remaining



If y Submicrost myons, and multiple unranned main adviserum ampaint in immortation. N. 2. Photograph of sugital section of the wicros, arteres myetic with Venetian red and viens with ultramanie belief Nülliura agod 40, uterus removed during the interval stage of the mensitual cycle mentituation profuse and prelonged The ultimicross myons (S. 31) projects into the uterine civily for o'the fall its occumiferance. The tention of the complete of the control of the complete of t

12 it was thicker than elsewhere in the specimen, but not actually by pertrophied. Three of these 12 were past the menopause; and the phase of the menstrual cycle when the uterus was removed, and the fact that some of them were operated upon soon after a prolonged flow, may account for the thinness of the entire endometrium in these specimens. The venous plexus of these portions of the endometrium is usually also hypertrophied, and the venous channels untiling the plexus of the



Its 30 Hypertrophied endometrum; ining utene cavity not encrossicled upon by monta X 4. Editors makes A., of a portion of the hypertrophied endometrum creation and the control of the con

endometrium with that of the myometrium are often larger than normal. The hypertrophy of the endometrium is due not only to its apparent increased arterial supply and venous congestion, but I believe it is also dut to the fact that there is not only room for it to grow, but there is a necessity for it to fill in the spaces (depressions) caused by the irregularities in the uterine cavity. This endometrium is nch in glands.

Trom a histological study of the mjetted specimens we would suppose that when menstruation occurs it would take place, not from the endometrium over the tumor, which is lacking in glands and a venous pletus so necessary for the flow, but from the endometrium not encroached upon by the tumor, which not only contains glands and a pletus,





lie 3: Submittons en younn, arterial circulation of the utime in tissue, expectally the endometratum functivation recently slightly more profuse). Slightly reduced in asc. Radiograph of a cross size, a jurn flow, a carrier significant with benuth. A submittons myoma afone in the fundation promoted into the utime cast). Several small intraminal myomata were also present. It is expected in the submitten of the utime cast). Several small intraminal myomata were also present. It is explored the utimes and tumon streaged. The endometerum anterior and posterior to the tumor is a trophed by the expected in the control of the control of the property of the control o

Ing 85 Submucous and intramural myomata sensor accruation of the uterus (menoringa) N. 4 Radiograph of a cross slice 3 mm thick, of the uterus and two momata Para aced 30, cens injected with beauth, uterus sentioned 41 const of mentional flow. The uterins considered a const of mentional flow. The uterins considered as one of the mentional flow of the balance of the protection of the surface of the myoma as no subscross myomata, but the bleeding did not arise from these in the instance "See next illustration".

but both often hypertrophied, thus suggest ing increased functional activity This plexus also communicates with a dilated myometrial plexus containing more blood than normal and united with it by larger channels have studied 3 specimens which were removed and injected the first day of menstruation (Figs 23, 24 25 and 26) In all these the portion of the atrophied endometrium over the tumor apparently did not take part in menstruation, and the most active flow occurred from the places above described have studied other specimens removed from patients who were flowing irregularly at the time of the operation and found the same to be true Unless the patient is actually flowing, or is about to flow or has just ceased flowing, the injection mass will not escape into the uterine cavity Changes in the venous plexus of the endometrium are essential for the flow, and these changes are usually initiated, in this group of cases, by the onset of

menstruation, though the bleeding may continue for many days or even weeks after-From a study of the injected specimens alone we would assume that the prolonged profuse menstruation so often seen in these cases was due to the hypertrophy of the endometrium, with its increased venous plexus which, through larger channels than normal communicated with a hypertrophied venous plexus of the myometrium. The clinical study of these cases showed that 6 of the 36 cases gave a history of normal menstruation, while in 30, menorrhagia or metrorrhagia was present. We must also bear in mind that uterine bleeding is the symptom which usually induces these patients to consult a physician and also influence the physician to advise an operation Therefore, a greater proportion of those with bleeding are operated upon than those who are not bleeding, and the ratio of 30 to 6 does not represent the true ratio When we study the specimens in these two groups, i e, those with and without bleeding, we find the same anatomical conditions present in both groups In fact, some of the patients with the thinnest endometrium had the most profuse bleeding As stated before, the thickness of the endometrium varies with the individual, her age,



Ing 39. Visistrating endometrium from sine specmen as perceding. X 1. Radina, sph of a tors, slac.; mm that, of the body of the utters near the funder, and above the two migorita, shown in the perceding distradible the two migorita, shown in the perceding distradible the two migorita, and the perceding distramals, which escaped from the supertical portion of the troops pleurs of the endometrium not introviced upon by the myomata, and here the endometrium is slightly pertrappined. The utters was unable to control is

and the period of the menstrual cycle when the uterus was removed — thickest just before menstruation, thinnest just after, and especially after a profuse flow

Some of these cases do not bleed, and this is apparently because the uterus is able to control the flow, even though the uterus as a whole contains more blood and has to work under disadvantages, i e, portions of the endometrium are hypertrophied, the venous plexuses of those portions and that of the myometrium are dilated, and the venous channels uniting the two are larger than normal, and the uterine cavity on account of its shape is difficult to close On the other hand, many of these cases have menorrhagia or metrorrhagia, and this is due to the inability of the uterus to regulate the flow, which is due to many factors, and I believe chiel among these are functional ones, especially muscular inefficiency

The factors which might increase the flow

1 Increased ovarian activity, which can not be detected anatomically, though the ovaries are sometimes enlarged. The myomatous uterus may stimulate the ovaries chemically and also through the increased vascularity of the uterine circulation.



I by an Submussage myona prisoning at the external or (sight irregular bleeding). N; I Photograph of a sapitial section of the uterus exposing the submussage myona. Pata, aged cr, seem injected with ultramanne blue and atterns with bremoth. The uterus also contained ascerda small intramunal myomata. The venous assertion of the myona, at X, X, X, which had become coded. The patent gave a hastory of memorthage they cars before, which gradually levened and lately here assubget arregular bleeding.

2 More arterial and venous blood for the uterus to handle and the possibilities of venous congestion, due to the greater volume of venous blood in the uterus and in the uterine and overans vein- and because the tumors themselves sometimes mechanically interfere with the return flow of blood

3 Localized hypertrophy of the endometrium, where it is not directly or indirectly encroached upon by the tumor This hypertrophy carries with it the possibility of increased functional activity, and I refer especially to glandular activity and the production of a ferment which would not only



Fig. 41. Menonyoma and mindl intramiral myomatic monorangin). X : Photograph of median sugital section of the uterus: Para, aged 45, afterest supered with Venetian red and uens with ultransme blue, uterus removed during the interval slage of the mentical cycle myomatic appear in this section, the earlier steries coavity including each cornu, is surrounded by a diffuse advancement of the contract steries and the monorant appear and continuous was exceptively additional contractions of the contraction of

alter the venous plexus of the endometrium at the onset of menstruation but which might retard its subsequent repair

4 Dilatation of the venous plexus of the localized hypertrophied portion of the endometrium, and that of the myometrium into which it empties and the venous channels between the two, making the control of the "protective" zone between the two more difficult

5 Dilated veins sometimes present in the endometrium over the tumor, which may through pressure become eroded or may be acted upon by the products of the glands at the time of menstruation (I have occasionally seen slight extra-asation of the injection mass into the endometrium over the tumor, and can see how that bleeding may arise from this situation, but have never found any other proof of this.)



Fig. 22. Adenomyoma, and rulus intramural myoma encroaching, tono the uterine curving. Attenti impection (Altentization, normat) Slightly reduced in size. Radio-rapid of a coval size. A min. tick., of the body of the uterus beamin, attent repowed during the internal stage of membratus cycle for chronic pelvice peritorias. The intramural myoma is very vascular and the diffuse adenomyoma surrounding the greater part of the uterine cavity not encouched upon by the intimural myoma is more accordant to the control of the control o

6 In an irregular uterine cavity which is difficult to close

Any one of the above mentioned factors might prolong or make more profuse the menstrual flow, and yet all these conditions are sometimes apparently present in patients in whom menstruation is unaltered lieve that while all of the above factors contribute to disturbances in menstruation, we are forced to admit that the failure of the uterus to control the menstrual flow in these cases is in a large measure functional functional disturbance might be ovarian, in the endometrium, or in the myometrium, and . my studies have led me to support Theilhaber's views that muscular inefficiency is the most important single cause of the abnormal bleeding. Theilhaber has shown that the muscular fibres of the myomatous uterus are smaller in patients with a history of bleeding than in others.

The type of bleeding caused by intramural myomata encroaching upon the uterine cavity



Fig 43 Adenomyoma and large intramural myoma (Menstruation, moderate, normal) \(\lambda\) 2 Photograph of median sagittal section of the uterus and portion of large intramural myoma. Para aged 49, arieries injected with Venetian red and veins with ultrimarine blue, ulerus removed in post menstrual stage of menstrual cycle. A large intramural myoma, 14 5 cm in its long diameter, is present in the posterior uterine wall, only a nort of it appears in the illustration. The myoma in the anterior uterine wall is an adenomyoma and there is beginning adenomy oma about the upper portion of the uterine cavity The venous plexus of the myometrum as dilated endometrium is hypertrophied except over the adeno-myoma. Some of the venous injection mass escaped into the cavity. Uterus removed just after the menstrual flow In spite of the increased vascularity of the uterus and the presence of a large intramural myoma and adenomyoma, menstruation was moderate in amount and normal, i e, the uterus was able to control its venous circulation

is a profuse or prolonged menstruation, or both profuse and prolonged Sometimes, intermenstrual bleeding occurs, and I think that it is but a further index of broken compensation. I have not had the opportunity to study a sloughing myoma, but would expect that when such a specimen was injection to the properties of the properties of the tumor and hence would be arternal rather than venous, as occurred in all the specimens studied in this series who were flowing at the time of the operation and where the injection mass secaped from the endometrum

Multiple medium size and large intramural myomata encroaching upon the uterine cavity— This group should be a subdivision of the

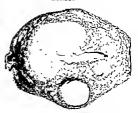


Fig. 44. Idenomenous and small internutal measurements spectros (sever memorrhages) A. 7g. Response of the control of a cross-size, giant thick, through the lumbine of the crush of a cross-size, giant thick, through the lumbine crush of the crush of th

preceding one The changes are similar to the preceding one The areas of hypertrophied endometrium are found in the crevices between the tumors and wherever the nutrition of the endometrium is not interfered with by the tumors intercepting it or from pressure (Figs 31 and 32) The uterine cavity is often greatly distorted and therefore more difficult to be kept enclosed (Fig 33). Ten such specimens were found Two gave a history of normal menstruction, 7 of menorrhagia, and 1 of metrorrhagia. In 9, areas of hypertrophied endometrium were found, and in I (the one with metrorrhagia) the endometrium was everywhere atrophied (the patient's age was 50)

SUBMICCOUS MAGMATA

Changes Caused by Them in the Circulation of the Ulcrus

Sixteen specimens were obtained where a submucous myoma was the principal condition present. In addition, 3 of the 12 speci-



Fig. 43. Administrating actions injection interstitution normal, always produce. In Randorstaph of a cross-life, it mm, thirk, through the body of the stress. Paracel 43 version specied with formal startes through the production of the post interstitution of the post interstitution of the statement of a specied with the interstitution of a subcrision of a specied with the control of the stress of the stre

mens with adecommonate also had submucous myomata. I have midded as submucous myomata all myomata protruding into the utrine cavity for half or more or their circumference. They represent a later stage of the preceding variety. Of these to specimens more than one submucous myoma wafound in 5, and in all intramural myomata of various sizes were found.

The changes caused by the sessile submucous myomata are similar to those found in the intramural tumors already considered Pedunculated submucous myomata were found in 8 specimens and one of these presented at the external us The endo metrial surface of the pedunculated involute simulates very closely the serous surface of the pedunculated subscrous variety endometrial surface is devoid of true endometrum, and the endometrum covering the uterine cavity in contact with the tumor is usually compressed while the endometrium bining the cavity and not in contact with the tumor is always comparatively thicker and often hypertrophied We would suppose that menstruation would occur mainly from that portion of the endometrium containing glands and having a good blood supply and not com pressed by the tumor, and such is the case (Figs 38 and 39). The menstrual history

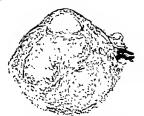


Fig. 46. Minomission 1, dipost osciluling the uterine costs. Small internated missing visions sinjection Menstraction normal product 1 X 1. Vallipara aged 28. The uterus were removed for chemic pelva periodicis. The uterus curva every small being almost oxcluded by the identification of 12 4, will apply of the

of these cases showed that all but one gave a lustory of menorrhagia or metrorrhagia as in the menstrial history of intramural variety with menorrhagia, and it was not a constant symptom, i.e., it did not occur with every monstruation.

As stated, these tumors do not necessarily cause bleeding, but apparently cause it in a larger percentage of the cases than the precoming. They represent a later stage of the disease. They are more not to have metrorrhagia which is also a manifestation of a later stage of the disease. The metrorrhagia in some of these cases may come from runture of the your over the surface of the tumor I was able to demonstrate this in one of my specimens (Fig. 40). We know that intraperstoneal hamorrhage may occur from the rupture of dilated veins over a subserous myoms In a pedunculated submutous tumor the return of the venous blood is often interfered with and the surface of the tumor is exposed to trauma and irritation

ADI NOVI QUATA

Changes Caused by Them in the Circulation of the Uterus

This variety of myoma was found in twelve specimens, and in each specimen other varietics of myomata were also present. In four,





is a profise or prolonged mensituation, or both profuse and prolonged Sometimes intermansimal bleeding occurs and I think that it is but a further index of broken compensation. I have not had the opportunity to study a sloughing myoma, but would expect that thin such a specimen nas injected the injection mass would escape from the tumor and hence would be arterial rather than venous, as occurred in all the specimes studied in this series who were flowing at the time of the operation and where the injection mass escand from the endometrium

Multiple medium size and hirge intramural myomala encroaching upon the ulcrine casily— This group should be a subdivision of the



Fig. 44. Micromotoms and smill internutal poyme sensors injustine (sector memorphism). 3.4. Salograph of a cross-slee, 5 mm (this, through the fandio of large properties of the state of the salor of the comsistence was bleeding dightly is short promoted. In adormotom (approximally developing in each corn) surmanded the greater person of the attention cardy, a small starpletus of the myometrum is dilated. The endomitrum exercise into the strain cavity, which give eper The exercise into the strain cavity, which give eper The amount and duration and offers lasting several with Last flow several seem sucks before the operation and official hely opt started to dismagnin. The uteres was

preceding one. The changes are similar to the preceding one. The areas of hypertrophied endometrium are found in the crevices between the tumors and wherever the nutrition of the endometrium is not interfered with by the tumors intercepting it or from pressure (Figs 31 and 32) The uterine cavity is often greatly distorted and therefore more difficult to be kept enclosed (Fig 33) Ten such specimens were found Two gave a history of normal menstruation, 7 of menorrhagia, and 1 of metrorrhagia In o, areas of hypertrophied endometrium were found, and in 1 (the one with metrorrhagia) the endometrium was everywhere atrophied (the patient's are was so)

SPRANCOUS MAONATA

Changes Caused by Them in the Circulation of the Ulerus

Sixteen specimens were obtained where a submucous myoma was the principal condition present. In addition, 3 of the 12 speci-



Fig. 49. Adenocaremona of the body of the uterus (mail intramural myonata also present) verous injection (metiorinaga arising two years after the mempassed XT. Photograph of a cross section of the funds of the uterus. Xulliparia, aged as a steries neperior of the section of the control of the present of the section of the compasse at smertorings of two years duration. Small inframural myonata are also present in the uterus though none appears in this section. The corresponding of the present in the uterus. The growth of the present in the uterus of the uterus of the present in the uterus of the uterus of the present in the uterus of the u

plexus of the myometrium as do the intramural myomata of their size (Figs 41, 44, 45 and 46) Their relation to the endometrium is interesting. In two of the specimens the adenomyoma was in no place continuous with the endometrium (Fig 47) In the remaining ten, it was continuous with it, and in four surrounded nearly the uterine cavity I recently operated upon a patient (not in this series) in which an adenomyoma was present in each tube at its origin from the uterus. Four of the twelve specimens suggested the simultaneous development of the tumor in each cornu (Figs 44 45 and 46) In my specimens the endometrium lining the uterine cavity over these tumors was thinner and less vascular than the endometrum bring other portions of the uterme cavity (Fig 43)

In five menstruation was unattered by the myomata (including adenomyomata) present In two of these menstruation was moderate in amount, while in three it was profuse but not excessive. A radograph of a cross shee of the uterus of one of these with moderate menstruation is shown in Fig. 43 and the other, with a similar menstrual history, contained small discrete intramural myomata, in one of which areas of mucosa were found



It go Same specimen shown in preceding illustration arteral myection. Radiograph of a cross date x mm duck, photograph of the same shown in the preceding industration, arteres injected with bomoth. Fine arteral supply of the uterus to diminished due to patient's age, to after the menopsium. The carenoma has an arterial blood supply but less than the no more runn. The bird in a critical production of the carenoma has to a consideration of the carenoma has to a course from the endometrum.

The three with profuse but normal menstruation are shown in Figs 42, 45, and 46 Five gave a history of menorrhagia, two of these specimens also contain a discrete ordinary submucous myoma and intramural myomata in addition to the adenomyoma. In the other three the adenomyoma was apparently responsible for the menorrhagia, although bilat. eral ovarian cysts were present in two of these three, and small ordinary intramural my omata were also present. These three are shown in Figs 41, 44, and 47 Two gave a history of metrorrhagia, one profuse, the other scanty. In the one which was profuse a polyp and small intramural myomata were present, in the one with occasionally "spotting" an ordinary submucous myoma, small intramural my omata, and tuberculosis of the endometnum were present in addition to the adenomyoma

Only two of the twelve patients were flowing at the tune of the operation, and only one of these lends itself to the study of the source of the bleeding in adenomyomata, as the other contained an ordinary submucous myoma, had tuberculosis of the endometrium, and had been curetted a few days before The first one (Fig. 44) showed that the venous flow escaped from the endometrium over a portion of uterus not involved by the tumor.

This subject needs further investigation, but the clinico-pathological study of my twelve injected specimens shows that these tumors do not necessarily disturb menstruation five of the twelve did not - and that when menorrhagia or metrorrhagia is present it may be due to an ordinary myoma, as three of these had ordinary submucous myoma in addition to the adenomyoma or some other well-known possible cause of these symp-On the other hand, I believe that adenomyomata sometimes give rise to abnor mal uterine bleeding, as in the cases shown in Figs 41 and 44 These cases suggest that the etiology of the bleeding is similar to that in other myomata and apparently does not arise from the tumor, but as in others is due to the uterine insufficiency. 1 e, the mability of the uterus to control its increased venous circulation and prevent an excessive flow of venous blood at the menstrual period

SUMMARY OF CASES CLASSIFIED ACCORDING TO THEIR MENSTRUAL HISTORY AND CON-DITIONS PRESENT

Forty seven of the patients gave a history of not having had any disturbance in menstru atton. Of these, 22 had small intramural and some small subserous myomata, 17, medium size and large intramural myomata, 25, adenomyomata and small intramural myomata, 2, large subserous and small intramural myomata, and r. a submiseous and small intramural myomata, and r. a submiseous and small intramural myomata.

Sixty-four gave a history of profuse menstruation often prolonged, i.e., the so-called menorrhagia as the predominating type of abnormal bleeding. Thirty nine of these had intramural tumors encoaching upon the uterine cavity as the apparent cause; in 10, a submucous tumor was present, small intramural tumors not encroaching upon the uterine cavity were found in 9, adenomyoma with other varieties of myomata were found in 5, small intramural tumors with a polyp were found in 2

Thirty nine gave a history of irregular bleeding, i e., metrorrhagia as the predominating symptom Carcinoma of the cervix with intramural myomata was found in 8, carcino ma of the body of the uterus with myomals in 5, polypi and small intramural tumos in 5; small intramural tumos in 5; small intramural myomata not encroaching upon the uterine cavity, 4; large intramural myomata, 3, adenomyomata with other forms of myomata, 2; tubal pregnancy and myomata, 3, incomplete abortion with myomata and infection (one puerperal, other probably gonorrhecal), 2, by datiform mole with myomata, 1, sarcoma, 2.

This grouping shows that any one variety may or may not alter menstruation, and that the bleeding present, especially if of the metrorrhagic type, is often due to some other condition

THE INFLUENCE OF UTERINE MAGMATA ON THE AGE OF THE MENOPAUSE

Myomata, except very small ones, increase the amount of blood in the utero-ovarian cirele The ovarian arteries and yeins are hypertrophied as well as the uterine. The excess over the normal amount of blood is apparently for the most part diverted to the uterus, and there diverted to the tumor The usual physiological arterial sclerosis incident to the approaching menopause would prob ably affect a larger vessel less quickly than a smaller one We would expect that an efficient blood supply to the ovaries would be maintained at a later age in women with myomata than those without, and, therefore, the functional activity of the ovaries in such women would persist longer, even though the excess over the usual amount of blood is apparently diverted to the uterus The same would also hold true for the uterus, especially if it contained intramural myomata; i e, ne would expect that the endometrium or portions of it would maintain its circulation at a later age than in the non-myomatous The generally accepted view is that the menopause is delayed in women who have myomata, and my studies confirm this Sixteen of the 150 patients had passed the menopause; the earliest age at which this occurred was 45 (had two very small intramural myomata), the next earliest 48, and the latest 56 The average age of the menopause in the sixteen patients was 51+ years

SARCOMA AND MYOMA OF THE UTERUS

Sarcoma was found in only two specimens. The first patient, a nullipara, was 50 years of age and bad been bleeding for 6 months. Small intramural myomata were present, and the uterine cavity was filled with a growth which protruded partially from the cervix and extended through the uterine walls and invaded the adjacent structures. It was impossible to state if it was primarily sarcoma or sarcoma had developed in a myoma. This specimen was so badly mutilated in its removal that it could not be satisfactorily injected. The patient died six months later, and at autopsy an extensive local recurrence was found, and metastases were present in the lungs.

The second patient, a nullipara, was 57 years of age. Irregular uterine bleeding was of six months' duration, and began two and a balf years after the menopause The uterus contained several small myomata, a large Intramural myoma, and a submucous myoma. A small area of the submucous tumor showed The blood supply of this area seemed similar to that of the myoma in which it had developed. It contained vessels filled with the arterial injection mass, but did not show any filled with the venous mass. The arterial and not the venous mass escaped into the uterine cavity (Fig. 48); i e, the bleeding was of arterial and not venous origin, as occurs in uterine bleeding arising from the endometrium. The patient died six months after the operation, with symptoms of bronchitis and pleurisy (tapped and fluid removed from pleural cavity), thus suggesting pulmonary metastases An autopsy was not obtained.

CARCINOMA OF THE UTERUS AND MYOMATA

Eleven uteri were removed for carcinoma of the cervix while collecting this material and injected as a routine procedure. Myomata were found in eight specimens; in seven the myomata were small and of the intramural type. In the eighth small myomata were present, and in addition a large intramural myoma and a myoma of the cervix; the latter was of the submucous type and protruded into the vagina. The youngest patient was 32,

and the oldest 57; the average age of the eleven patients was 43+ years.

Five uteri were removed for carcinoma of the body, and in all, small intramural myomata were found. The youngest patient was 50 and the oldest 62; the average age of the five patients was 57+ years.

It is impossible to draw any conclusions from such a small number of cases, but they emphasize the frequency with which myomata are found associated with carcinoma of the tuterus and, especially, with carcinoma of the body, to which references may be found in the literature.

It is very difficult to obtain a satisfactory injection of either the arterial or venous supply of the cervix of a uterus removed at operation, because the injection mass escapes from many small cervical vessels which are injured at the operation, and the injection of all my specimens on this account was incomplete. Nevertheless they showed that carcinoma of the cervix has an arterial blood supply, apparently less than the normal cervix, and as in myomata it is difficult to demonstrate any veins. The arterial injection mass and not the acrous escaped from the growth during the injection of the specimen The necrosis incident to the growth leads to destruction of portions of the cancer and injury to its arteries, with subsequent hæmorrhage of arterial, not venous, origin My studies of the blood supply of carcinoma of the cervix are unfinished and must be reserved for a later nublication.

The injection of uteri containing carcinoma of the body is easily accomplished, and my specimens showed that this type of growth has an arterial blood supply, but less than the myometrium, and that they are also deficient in veins. In every instance, the injection mass which escaped from the growth was arterial and not renous (Figs. 49 and 50).

OVARIAN CYSTS AND UTERINE MYOMATA

We are aware that the ovaries are responsible for the changes in the uterus leading up to the menstrual flow, and that it is possible that they are of importance in the regulation of the amount and duration of the flow. Therefore, disturbances in the circulation of the

uterus may influence the functional activity of the ovaries and lead to changes in the ovaries. The ovaries of patients having myomata often are apparently normal, even in those causing marked changes in the circulation of the uterus. At times they are enlarged, the so-called "myomatous ovaries." and at times cysts are present. I have not studied the ovaries of all my specimens histologically, as in many instances they were not removed or only one was removed. In seventeen instances ovarian cysts were found, and in twelve of the etheoperation was undertaken for ovarian cysts and the myomata were of secondary importance. Carcinomatous ovarian cysts were found in two instances. dermoids in two, bilateral hamorrhagie ovarian cysts in eight, Graafian follicle cysts in three, bilateral infected ovarian cysts in one, and adenocystoma in one. Of the 150 cases, 17 were associated with ovarian cysts, and 8 - i. e., nearly half of these-were associated with bilateral ovarian cysts containing a thick bloody material in the cavities of the cysts Of the 17 specimens with ovarian cysts, 5 were associated with adenomyoma. Of 12 cases of adenomy oma of the uterus (also containing other forms of myomata), 5 of them were associated with grarian cysts, as compared with 138 cases of myomatous uteri not containing adenomyomata and associated with ovarian cysts in only 12 instances ovarian eysts associated with the adenous omata were not all of the same kind. In four of the five the cysts were bilateral, and the one that was unilateral had had a previous operation in which an ovary had been removed for a small cyst. The cysts in two instances were apparently Graafian follicle cysts, in two others the cysts contained the hæmorrhagic material mentioned above and in the fifth bilateral infected cysts were present. Of the 17 cases, only 6 gave a history of menorrhagia or metrorrhagia, and in all 6 myomata of a type apt to cause uterine bleed-

ing were found,

The patients with dermoid, cancerous cysts,
and cystadenoma, associated with myoma,
were probably accidental associations, and
sessum may be true of the others. The
sessum con these findings, especially the

apparent frequency of adenomy oma associated with ovarian cysts, is based on too small a number of cases from which to draw any conclusions.

SUMMARY

As a result of ovarian activity, the uterus undergoes periodic changes which manifest themselves clinically by the menstrual flow, The flow is preceded by changes in the venous plexus of the endometrium, permitting the escape of blood into the tissues of the latter. The duration of the flow and the amount of blood lost is probably dependent upon many factors, such as changes in the endometrium, the time necessary for the repair of the altered endometrium, the degree of venous congestion of the uterus and the ability of the uterus to control its venous cir-These factors are not entirely exident in anatomical conditions which we can detect, but are probably controlled mainly by the functional activity of the uterus, the evaries, and, possibly, other structures and the interrelation between these. I have demonstrated that menstruation is mainly, if not entirely, a venous flow and can occur only when there are changes in the venous plexus of the endometrium, permitting the blood to escape. As there are not any valves in the uterine veins, the duration of the flow and the amount of blood lost is dependent upon several factors, and, especially, the ability of the uterus to control its venous circulation, i. e., to prevent an excessive escape into the uterine cavity when there is a leak in the venous plexus of the endometrium, as occurs at the menstrual flow. The most important factor in controlling the venous circulation would be the muscular efficiency of the uterus and the regulation of the same, however it may be accomplished Small subserous myomata are relatively

influence on the uterine circulation.

Large subserous myomata are very vascular (arterial), and cause a hypertrophy of the uterine artery from which their nutrient artery arises, and thus more blood is carried to the uterus and tumor, the excess over the normal being diverted to the uterun. More remous blood is carried back to the uterine

anæmie and do not have any appreciable

and ovarian veins. The chief arterial and venous changes are in the peripheral zone of the uterus; the radial zone and endometrium are but very little affected, and menstruation is usually not altered.

Small intramural myomata are less vascular than the myometrium and apparently have very little influence on the circulation of the uterus, and usually menstruation is not altered. As cases sometimes occur with a history of menorrhagia or metrorrhagia in which small intramural myomata are lound, these cases suggest that those tumors may in some way lead to uterine inefficiency, especially muscular inefficiency, with a resulting loss of control of the venous circulation of the uterus.

Intramural myomata over a 5 cm in diameter are usually more vascular arterially than the myometrium, but less vascular venously Some of the large tumors are so very vascular that the injected specimen appears more like an arterial angioma than a myoma. The greater the arterial supply of the tumor, the greater the increase in the arterial supply of the uterus containing it, but, as in the subserous variety, at least, the greater part of the increase over the normal is diverted from the uterus to the tumor.

The venous plexus of the myometrium is always dilated, and this is most marked about the periphery of the tumor, and especially in places where the pressure is least. The venous uterine congestion is apparently mainly an active one, and the uterine walls are apparently hypertrophied in order to control The endometrium, if not encroached upon by the tumor or tumors, is often hypertrophied, and its venous plexus is also dilated Menstruation may or may not be affected, and when excessive or abnormal bleeding occurs it is apparently due to a loss of uterine efficiency; i. e., the uterus is unable to control its dilated venous plexuses, and, there not being any valves, it is unable to prevent the escape of an excessive amount of blood into the uterine cavity at the menstrual flow. The regenerative changes following menstruation, i. e., menstrual involution, is also sometimes retarded. This may be due to changes in the endometrium, which are

possibly dependent upon the disturbance in circulation.

Intramural myomata which encroach upon the uterine cavity alter the shape of the cavity and intercept or push to one side the radial arteries which supply the endometrium over the tumor, and this, with the pressure exerted by the myoma, causes an atrophy and anæmia of this portion of the endometrium endometrium directly opposite the tumor may also be thinner and less vascular than normal, due to the pressure of the tumor. The endometrium not directly or indirectly encroached upon is always thicker and more vascular, and is often actually hypertrophied and its venous plexus more dilated than nor-The condition of the endometrium in any specimen is dependent upon the age of the patient and the phase of menstrual cycle when the uterus was removed. The menstrual flow arises mainly from the endometrium not directly or indirectly encroached upon by the tumor, i e., the endometrium, which has an abundant blood supply, contains glands and is usually hypertrophied. The atrophied, anæmic endometrium over the tumor which has a poor blood supply, and in which the glands are few in number or entirely absent. takes a very small part or none at all in the menstrual flow Disturbances in menstruation may or may not occur. The profuse flow, when it occurs, is only in a measure dependent upon the increased amount of venous blood in the plexuses of the myometrium and endometrium, the larger channels uniting the two plexuses, and the hypertrophy of portions of the endometrium and the distortion of the uterine cavity making it more difficult to close. This disturbance is anparently due more to the failure of the uterus to control the venous blood under these adverse circumstances, and a retardment of the regeneration or repair of the endometrium. Two specimens may appear the same, yet in one, menstruation is normal, and in the other, excessive; nor can we discern anatomically why both should not give the same menstrual history. Occasionally, dilated veins in the endometrium over the surface of the tumor may become eroded and give rise to abnormal bleeding, but the usual and chief source is from the portion of the endometrium described above.

Submucous my omata represent a later stage of the intramural variety, and the veins over the surface of the tumor are more apt to become injured or undergo degeneration than those over the intramural tumors. The source of the profuse mentruation is usually the endometrium not encroached upon by the myoma Menstruation is more often abnormal, but may be normal

I have not studied a sufficient number of specimens of adenomyomata to state definitely the source of bleeding when this variety is prevent. Only twelve uteri were encountered containing these tumors, and in all twelve other types of utenne myomata were also present. There caves showed that disturb-

ances in menstruction are not necessarily present, and when they occur they may be due to changes caused by other myomata in the specime. On the other hand adenomyomata may cause menorthagia or metrorrhagia, just as other intramural myomata encroaching upon the uterine eavity do. When abnormal bleeding is pre-ent, it is apparently dependent upon the same factors as other types of myomata, and the excessive flow does not arise from the tumor itself. This variety must be reserved for further study.

My studies have led me to believe that when the bleeding arises from the tumor itself, due to sloughing or sarromatous changes, it would be arterial (the tumors have a rich arterial supply), and not venous, as occurs from the endometrium

TYPHO-TUBERCULOUS TUBO-OYARIAN ABSCESS

BY WAY D FULLERTON, PR B, M D., CLEVELAND, OHIO

THE case I have to report has proved to me to be one of great interest, the finding of both the typhoid and tuberculous infections being accidental and entirely unsuspected Then also, on looking up the available literature on the occurrence of typhoid infections of the female gental organs I find but three cases reported definitely, one each by Gans (1), Koch (2), and Dirmoser (3), and the bacteriological study of the case of the last author leaves a doubt as to whether the organism recovered was really the B typhosus More often have I found typhoid pelvic infections merely alluded to and the statements made that such infections may occur, but no instances cited Henning (4) states that harmorrhagic salpingitis may accompany the acute exanthemata, and that toxic irritation may give a mild salpingitis, typhoid fever being one of the etiological factors for the toxemia Durck (5) believes that acute infectious cophoritis may be caused by the B typhosus. Von Henkelom-Sregenbeck (6) in his work on "Pathogenesis of Diseases of the Adnesa," states that ty-

phoid may be an etiological factor Lebedinsky, Skrobansky (7) and others, have shown that with the acute infectious diseases, among them typhoid fever, the ovaries undergo changes varying from cloudy swelling to neute parenchymatous inflammation, similar to the changes in other parenchymatous organs in these infections, and furthermore, that neither the severity nor the duration of the disease has any relation to the amount of degeneration found, mild infections giving marked changes and vice versa. These changes if mild, clear up as elsewhere, but if severe and extensive, may, as Lebedinsky states, affect the reproductive activity or give rise to chronic trouble with these organs.

Dobbin (8) has reported a case of puerperal infection from which B typhosus, streptococcus and staphylococcus were all recovered. The bacteriological study of this case makes it certain that the typhoid bacillus was recovered, and Dobbin believes that the patient was infected at the time of delivery by a midwife, the patient occupying same room and bed in which her husband had died a short

time previously of typhoid fever. Hirst (9) states that he has at different times recovered the typhoid bacillus from the puerperal uterus, enabling him to make a diagnosis of typhoid fever when sepsis was suspected.

From this summary it will be seen that pyogenic typhoid infections of the female pelvis are either rare or seldom observed and almost never reported. The case I have to

present is as follows:

Mrs F., Gyn. No. 4486, a matried German woman of 25, entered the Lakeside Hospital August 15, 1912, complaining of "pain in the right side and back for the previous three months, and of feeling very weak and tired "

Family history Unimportant Past history. Always healthy as a child thelve years of age a thyroid enlargement was noticed which increased gradually in size during the next nine years, then, four years ago, she had a thyroldectomy in Prague Neither during the past on careful questioning or at present on careful examination, were any of the symptoms of Graves' syndrome discovered, except a moderate exophthalmos, which the patient said she had always had The patient on admission had a rounded, symmetrical, fluctuating, subcutaneous tumor, 3 cm in diameter, which seemed to arise from the thyroid isthmus. There had been no cough, bemoptysis, night sweats, tachycardia or gastric distress, though she had lost twenty pounds in weight during the previous three months Bowels were regular daily Menstruation began at seventeen years, was regular every four weeks, flowed moderately for three days, the flow being accompanied by a great deal of pain, mostly in the lower part of her back. She had been married ten months, no children or miscarnages Her husband had gonorrhora four years previous to his marriage, was carefully treated and apparently cured. The patient gave no history of venereal disease nor did she admit any of their signs or symptoms She had never had any pelvic trouble until her present illness

Present illness Fourteen weeks previous to her admission the patient had pain in her right lower quadrant, which her physician diagnosed appendi citis. She refused operation After two weeks' medical treatment, during which time her condition improved slightly, she suddenly became worse and called in another physician, then, three months prior to admission, the patient went to bed with a persistent bad headache which lasted for a neek or more At this time she had fever which persisted for slightly more than three weeks. Her bowels were loose and once she remembers having seen some blood with them. She was slightly debrious at times and had some slight burning on urination She was kept on a liquid diet.

The pain in her right lower quadrant which had

been continuous since her attack of typhoid, but which had gradually become much worse, with acute attacks many times during the day, had practically confined her to her bed and rendered her incapable of any exertion The pain was not noticed

at night, as she slept well Physical examination on admission. The patient was a rather poorly nourished noman, somewhat anamic The thorax was long and thin, with some flattening of the infraclavicular region, the depth of the supraclavicular fossa on the right side was greater than on the opposite side Over the upper right side, expansion lagged slightly and was somewhat diminished Vocal fremitus was increased and the percussion note was slightly higher pitched and dulled in tone

Faint moist râles were heard during inspiration. The heart was somewhat enlarged though the sounds were clear There was rather marked tenderness in the lower abdomen and some muscular rigidity

Pelvic examination The outlet was in good condition, the cervix crossed the axis of the vagina and was normal The uterus was small, the fundus forward and fixed On the right, extending down into the cul de-sac, was a firm, hard mass, which seemed to have softened areas. The left side was also adherent The physical examination was otherwise unimportant

On admission the urine was normal, the W B. C 15400 to the cu mm, lib 70 per cent, B P 105 mm.

Hg, Temp 100, pulse 98

Operation. Two days after admission, a short median incision was made and the pelvic structures found densely adherent Both tubes and ovaries formed ous sacs which ruptured on freeling the adhesions The right broad ligament formed a phlegmon about 2 5 cm in thickness, extending from the uterus to the pelvic wall. Both tubes and ovaries. with the phlegmon of the right broad ligament, were removed and the pedicles cauterized. The appendix was normal and removed. The abdomen was closed without drainage

The patient made a fair recovery from her anasthetic, nitrous oxide and ether, but by consulting her temperature chart it will be seen that the day following operation her temperature rose to 102 5. Her temperature varied from 90 to 102.5 for the next six days Her wound was then dressed for the first time and was found to be broken down. Iodoform tape drains were inserted and thereafter the wound dressed daily. The day following the first dressing her temperature began to drop, the following day reaching 98.5. Then, except for an unexplained rise to 103 5 on the eleventh post-operative day, the temperature gradually sought a lower level, but continued to show a morning drop and evening

The patient was discharged thirty-five days after the operation, the abdominal sinus still discharging slightly I might add that now, seven months after her operation, the sinus is not entirely healed. Hygienic measures were advised and the patient has gained twelve pounds in weight and feels very com-

fortable in every respect.

Pethological examination In the gross, the specimens removed at operation one es as negarably bound and matted together as to be almost indisble and the specimens of the specimens of the side was as individual in the mass from the ide was as individual to the specimens of of which was thick, of a dirty white color, densely attached to the underlying tissue and very much roughened and inflamed. In the mass from the left aide a differentiated poetion of the tube was patent for 1 cm and filled with post. The surface to the properties of the properties of the abovers on the mebt aide.

Microsconically, the picture of both of the tubes and ovaries were the same and were as follows right tube is much thickened, the ville of the fumen are destroyed and replaced by necrotic material and leucocytes flere there are many epitheloul cells forming tubercles which contain numerous grant cells The muscle walls are greatly infiltrated with small round cells, and the surface shows an abundant growth of granulation tissue in which there are a lew necrotic areas Right overy. The tunica albuginea is thickened and the cortex shous a few primordial and Graafian follicles There is an increase in fibrous tissue and a marked jound cell infiltration The medulia and one side of the ovary are replaced by granulation tusue and necrots, material, through which are scattered many typical tubercles, surrounding the necrotic tissue there is an almost solid wall of round cells

At operation, anahositures are taken of the pus from the pelvic aboresses. Trainination of the smears from these awais showed a rather that, short, bacillus, with rounded ends, and on staining with methylene blue I was particularly impressed by the inergularly in the stanning and the presence of numerous polic bodies. The growth of these organisms on all ordinary media corresponded to that of the B typhosis, in subculture they were much more regular in their stanning. The organisms were actively motile, does not negliturated completely more hour with typhod secum in a strength of 1-50. For this Widal reaction I am indebted to Dr. Keysee of the Lateside Hospital

With these facts, I doubt if anyone could doubt the specific types of this double infection. The question of which was primary and the probable mode of infection will be discussed later.

Now, since in them there are some points of similarity to my case, let me give a bis summary to the cases of Koch and Dirmoser referred to above Koch's case was that of a woman of twenty-eight, who had faad typhoid at fourteen. She came to the clinic and was diagnosed pelvic inflammatory disease.

operation the free fluid found in the pelvis was sterile, but mucopus from a cystic tuboovarian mass gave cultures of B. typhosus. That of Dirmoser was a woman of twenty who had had typhoid, the onset of which was five months previous to the onset of the symptoms of her present illness, which was one month previous to her admission. At operation the lower intestines were bound together and adherent to the anterior abdominal wall. A tumor the size of a child's head was adherent to the bladder in front, and attached to the right ovary, uterus and intestines. This tumor, a thick walled abscess, contained a gresish yellow, stinking pus There was an abscess and pyosalpinx on the left side. Microscopically the pus showed no organisms, but cultures gave colonies of the typhoidcolon group, the organisms of which were fairly bacilli, stained Gram negatively, did not ferment sugars or produce an indol reaction, but did cloud broth. They were considered to be B typhosus.

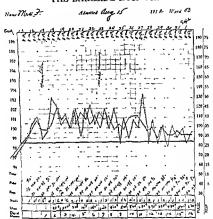
We are all aware of the frequency of posttyphoid suppurations and infections, in which the typhoid organisms are the etiological factor, such as osteomy elitis and the so-called typhoid spine, cystift, cholecystift, etc, and even circumscribed typhoid intercranial sup-

puration has been described.
With perfected technique, the constant
finding of typhoid organisms in blood cultures
in the early stage of the disease proves without a doubt that at this stage the disease is a
septicermia

We know that the condition induced by one organism favors the growth of other patho-genic forms (ro). Why, then, is it not trasonable to suppose that these organisms. Indian their way as they do to all parts of the body, should not, on finding a focus which is already diseased and the resistance lowered, find there a point most suitable for multiplication?

Other modes of infection are possible, but I do not believe so plausible. For instance, the infection may have been an ascending one through vagina and uterine canal, the organisms coming from the perineum. There is, however, considerable evidence to show that except in cases of gonorrhea or puerperal infection, this mode of infection rarely occurs

THE LAKESIDE HOSPITAL



Kelly (11) is of this opinion, and the experiments of Menge and Kronig, who introduced streptococci and staphylococci into the vaginas of pregnant women, showing that in twenty-four hours vaginal cultures were sterile, is evidence that the vaginas, at least of pregnant women, are quite resistant to infection. Pollack has shown that with other infections of the vaginal mucosa, especially genorrhoral, the vaginal mucosa loses much of its power of resistance, and progenic and intestinal organisms are usually present.

In the case I report, however, there was no evidence or history of any such previous infection.

Koch believed that the route of infection in his case was by the organisms wandering through the gut into the abdominal cavity, and then finding their way into the tube. doubt whether such an infection would be possible except with a perforation, which was not present in any of the cases reported, for had the wandering organisms been but few in number, the leucocytes would have taken care of them, and if the number of organisms were great other intestinal organisms would have accompanied them and a peritonitis resulted. Dirmoser is of the opinion that in his case the organisms wandered out of the large gut into the lymph spaces, then into the surrounding connective tissue, finally finding their way into tube and ovary. He admits the possibility of its being a hæmatogenous infection, but does not consider it so probable.

These theories, along with the possible penetration of the rectum or bladder by the organisms, with ultimate location in the tubes and ovaries, are practically, theoretically, and atomically so much more complex and improbable that, carefully considering all probabilities. I am very much in favor of the view that my case, at least, was hæmatogenous in origin

Stone (13) has seen numerous cases of secondary tuberculous infections, but does not say what the primary infections were, though he states that he does not believe the primary infection invited the secondary infection, a statement in which I cannot agree with him However, considering the advanced and extensive state of the tuberculous infection seen microscopically, one can scarcely doubt that the tuberculous pelvic condition. in my case, preceded the typhoid infection Weight is given this supposition by the fact that the patient had a pulmonary tuberculosis, which was very likely primary to the tuberculous condition in the pelvis

It is quite probable that the pelvic tuber culous condition was accentuated and progressed more rapidly with the subsequent typhoid infection, for, as Ravenel (12) points out, tuberculosis of the lungs with cavity formation, which is peculiar to man and the higher apes, is always a mixed infection, and being mixed, progresses more rapidly than in the lower animals which are not highly susceptible to other organisms

In closing, I might add that, though the number of organisms infecting the female pelvis is fairly extensive, but two cases of infection with so common an agent as B. influenza are reported, one an infected pyohydrosalpinx by Kiskault (14), and a case of puerperal infection with isolation of the influenza bacillus from the uterus, by Thalheimre (15).

CONCLUSIONS

 That in post-typhoid pelvic abscesses, the B. typhosus probably plays a more important rôle than is suspected.

2. That puerperal infections coincident

with or shortly following a typhoid infection may often have the typhoid organism as a causative agent.

3. With these conditions, a careful inquiry into the past history for typhoid infections will probably bring out some interesting results, especially when coupled with a careful bacteriological examination of all pus from pelvic abscesses.

4 That with a previous pelvic infection, which is more or less destructive and lowers the resistance of the parts, one would natural. ly more often expect to find a secondary infection

5. That the simplest and most plausible mode of infection is by way of the blood stream.

6. That hexamethylenamin, which has proven so useful in preventing post-typhoid cystitis, cholecystitis, etc., though its excretion by the uterine and tubal epithelium has not yet been proven, may here be found to be of advantage, at least in the prevention of such a post-typhoid complication

I wish to thank Dr Hunter Robb for his Lindness in permitting me to report this case, as it was in his service in the Lakevide Hospital that the case occurred

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HOW CAN WE IMPROVE THE RESULTS OF OUR OPERATIONS FOR CANCER?1

BY TRUMAN ABBE, A. B., M. D., WASHINGTON, D. C.

N looking over the mortality records of the census area of the United States, one finds, alarmingly near the head of the list, a condition that is all too well appreciated by the surgeon, namely, cancer death rate per hundred thousand inhabitants has increased from 64 in 1900 to 60 in 1905 and 76 in 1910 In the state of Massa-

chusetts, where we have figures extending over a longer period, the cancer death rate doubled between 1850 and 1875, and since then has nearly doubled again.

We all recognize cancer as primarily a surgical condition, surely curable by wise eradication in its early stages. And yet when we look at the results of our treatment of cancer they are most disheartening. Of the breast cancers coming to the surgeon nearly a quarter are already inoperable and at least one half of those operated on eventually die of recurrence Even in the most favorable cases, seen in the first six months and before the cancer invades the axilla, the reports of our large clinics show that one in five dies of the cancer In cancer of the uterus when clinical symptoms appear it is already very likely to be too late for eradication of the con-From forty to eighty per cent are conceded to be already inoperable, and of those operated on in the favorable cases possibly one in four lives more than five years. Sampson says that in half of the cases operated on, the cancer has already extended beyond the uterus, and what is called recurrence is truly but a continuation of the growth In the cancers of the stomach and intestines (which make up nearly one half of all the cancers) two thirds are inoperable when the diagnosis is made, and even then at the Mayo clinic nearly two thirds of those operated on have to be contented with hopeless exploration or a palliative operation. Even of those radically operated on, not much more than three per cent live beyond five years. Such reports

surely justify and emphasize the importance of the consideration of means to improve the

results of our cancer operations. The first question that arises is whether we have any other satisfactory line of treatment. The last six months have brought out several suggestions for constitutional treatment that offer some hope In Germany, Wassermann tells of experimental work on mice with an eosin-sclenium compound which, injected into the blood, has a selective action on cancer cells. killing them He has published no results of work on man. In Rome, Fischera has started work on an autolysate from human fectuses, which he has injected with apparent cures in twenty-five per cent of his eighteen inoperable cases. In New York, Berkeley and Beebe are trying a vaccine from the serum of mammals into which they have injected human cancer, and they report marked bene-But all this work is too new to be relied on at present, as our previous experiences in these lines have proven unsatisfactory; so that the local cradication of this disease must still be given first choice in the line of treatment. 1、食砂灰酸 原

For the local eradication of the cancer certainly the knife is the most serviceable instrument In certain cases of cancer of the cervix and in some skin cancers, contery, either actual or chemical, and radiotherapy have a very distinct usefulness. In some apparently hopeless cases of cancer of the cervix the cautery does what seems a miracle And in skin cancers, especially about the face, radiotherapy is undoubtedly taking the place of the knife. In fact, the Rontgen ray has demonstrated its usefulness to such an extent that it is being adopted more and more after all cancer operations. Such a use of radiotherapy, done with circumspection, undoubtedly will prevent recurrences in some patients and prolong life of more, thus improving our operative results.

The surgeon himself, however, can greatly

1 Road before the Washington Surgical Society, May 27, 2022 (See discussion, p. 227)

help the results of the operative treatment. First, in the careful selection of the cases suitable for operation. Confidence in-tead of doubt can be won for the surgical treatment of our cases by the painstaking diagnosis of inoperable conditions before starting the operation In the breast cases, the presence of distant metastases, especially in the mediastinum, the involvement of supraclavioular lymph nodes or the ehest wall all exclude operative cures. In the uterine cases the involvement of vaginal wall, bladder, or rectum, or the iliac glands, practically excludes cures. In the stomach cases, Boas says that the clinical symptoms are never present in the stage adapted to operative cure Certainly the involvement of the supraelavicular node, the umbilicus, the rectum, and the ovaries, all of which he frequently finds excludes any operative cure He calls special attention to the danger of finding the metastatic mass present in twents to thirty per cent of gastro-intestinal cancers in its usual seat in the rectum, on the anterior wall two to four centimeters above the prostate, not ulcerated, and not growing from the niucosa, and tlunking that mass the pri mary growth, though primary rectal growths almost always start from the mucosa and He speaks also of venous show ulceration thromboses in the legs as showing the existence of cancer in the blood. He would have us sift out all these inoperable cases by very careful examination before making even an exploratory laparotomy, and save the discomfort of finding the condition inoperable after starting the operation. If we can sift out the incurable cases and tell the patient or his friends the impossibility of cure without operating, and that we can do only a palliative operation, we gain the contidence of the laity in place of their distrust of our ability and show them the importance of seeking help early, instead of having the people blame the surgeon for inadequate work Mayo says, "If cancer surgery is in disrepute, it is because too large a proportion of patients is accepted for operation without explanation, at a stage when there is no possibility of cure and when the patients or their families should have been informed of the hopeless condition

If left without operation they would have been living examples of ill-advised delay instead of the unsatisfactory results of ill advised surgery,"

Second, we all appreciate the importance of doing radical early operations, removing the near lymph nodes, with the tumor, by block dissection, even before the lymph nodes show gross signs of involvement. And yet how often we see incomplete operations, not merely incomplete in not removing nodes but in doing too limited a local operation. Some of us are too likely to think of wound closure before cancer eradication. We all have had to do over cancer operations for local recurrence after a primary operation, by ourselves as well as by others, and yet we still at times try to persuade ourselves that in this particular case a less extensive operation will suffice, that in this cervix case we need not clear out all the loose pelvic tissue along the iliac vessels; that in this breast case, with a mass only the size of a hazel nut adherent to the skin. we need not elear out all the axilla and the deep pectoral lasera, that in this lip case we can wait a little longer until there is something palpable under the clun or in the neck before we do a radical operation. And yet we know that we should do the extreme operation at the outset Warner's figures from the Heidelhere Cancer Institute show that seventy per cent of all cancer recurrences are local from incomplete operations. To be sure a very large number of our cancer operations are done at a stage when thorough removal is not possible. But when we do get the opnortunity we certainly ought not to let it slip from us in the vain hope that the tumor mass embraces all vestiges of the canter To what extent we must be radical will always remain to be decided for each case on its merits by the

The danger of the limited operation has been brought out forcibly by Paine and Nicholson, who showed by experimental surgery on mice that incomplete removal of the cancer caused early retrude-sence in twenty-three per cent of the cases and that this retrude-sence was much more virulent than before the operation, developing at a rate two or three times as fast as the similar growths

judgment of that surgeon

in control animals. So that if we do not do a complete primary removal it is questionable whether any operation should be done, for we must bear in mind the chances of hastening

the nationt's end. Third, in the technique of operation the surgeon has one or two points to consider. Coffey has noted in breast operations, during the period when the operation was done from the chest towards the axilla, that recurrences appeared in the axilla, and that now, with the type of operation starting at the axilla and working towards the chest wall, the recurrences appear in the chest wall This he attributes to the manipulations of the cancer tissue during the operation, squeezing out the cancer elements into the wound. If this is the true explanation, then there is also a squeezing of the cancer elements through the tissues by tumor manipulation without cutting, and the least possible manipulation of the cancer area before the mass is out of the body the better. This would argue in favor of the minimum examination of the patient compatible with efficient diagnosis, and the preparation of the operative field with the least possible mechanical disturbance of the tissues, for example, the painting of the skin with iodine would be preferable to the soap and water scrubbing followed by the bichloride washing For the same reason, during the operation the manipulation of the tumor should be as limited as possible.

Again we note the frequency of stitchhole recurrences We can avoid many of the stitch holes by using adhesive plaster strapping to close the wound, notably in the breast and lip cases

So much for the work of the surgeon; but before the case comes to his hands the fate of the patient has often been determined. To get the best results from our surgery we must get the cases in the early stages. In some cases the patient, through ignorance or fear, refuses operation in the opportune moment of the early stage; and considering the proportion of post-operative recurrences which we acknowledge, the view of the layman is perhaps justified. But in the case where the diagnosis is made early, the layman should have quoted to him the results, not of all have quoted to him the results, not of all

cases, but of the early cases in the hopeful condition, with eighty per cent or more of curres; and when those results are instilled into the popular mind the layman will not so likely to procrastinate. There are a certain number of cases where the family physician attempts treatment of various lines before consulting the surgeon and so delays radical treatment until too late. And that result can be remedied only by education of the physician, preferably while he is a student in the medical school, but also later, through our journals, until he appreciates that thorough early eradication is the only

acceptable cure for cancer. But still more important is the question on which we all need education, that of how to make an early diagnosis of cancer. The statement of Boas, that when a patient has clinical symptoms on which we are justified in making a diagnosis of cancer of the gastrointestinal tract, he is already beyond hope of operative cure, and that of Otto that, of one hundred and ninety-six cases of cancer of the stomach and intestines, one hundred and twenty one died within six months of the first symptom - these statements show how inadequate the best of us are to make an early diagnosis of cancers that we cannot see or We are having brought out many new tests for cancer, all still in the experimental stage but offering some bope of diagnosis. Some are based on serum reactions, some on special ferment productions, some on urine changes The Rontgenographic study of the suspicious cases also helps in the diagnosis. Perhaps these tests will eventually lead to a diagnosis of the intestinal cancers at a curable stage

In the cancers of the breast and uterus, while it is also true that the condition develops in many instances without clinical symptoms till beyond the curable stage, yet it is within the power of the surgeon to make a diagnosis if he examines the patient in the early stage. To make these diagnoses we should get all women of the concer age to return for routine examination of breast and uterus every six months; just as most of the educated classes now go to the dentist for routine semination of the teeth, not waiting animal examination of the teeth, not waiting

for symptoms to drive them to seek aid. With the teeth, the penalty is a toothache. With the breasts and uterus, the examination is more distasteful to the patient; but the stake is not the fleeting toothache with at most the cost of a tooth extraction, but months of distress and horrors, and in the end, life itself. The women will permit and even request the examination if the physicians will do their part and show them the importance, We feel that it should be the duty of every accoucheur to get each of his patients to return every six months for examination of breasts and uterus. Many of his patients do come back to him for one thing and another fully that often and his suggestion of an examination would be welcomed without question If he finds no cancer the woman is happy. If he finds the cancer it is much more likely to be in a comparatively early stage and cure reasonably hopeful That the examination of the parous woman would not reach all the breast and uterus cancers is obvious Theilhaber found twenty-seven per cent of three hundred and forty-seven cases of uterine cancer in nullipara. Paus found thirty-one per cent of breast cancers in nullipara would do better than the accoucheur if we got all women over thirty-five years of age to present themselves for routine semiannual examination of breasts and uterus But the medical profession must win even greater respect than it now holds from the laity hefore the virgin of thirty-five years, without pelvic symptoms, submits to vaginal examina tion For that respect we must work

The most hopeful line of improvement in our cancer treatment, however, is in prophylaxir From the study of the cancers of which we can get a history from their incipiency we appreciate that certain factors lead to the development of cancer—persistent irritation, physical or chemical The chronic inflammation, chronic uleer, scar, wart, mole, irritant secretion, hidden blood cot following trauma, colloid collections as in the thyroid, fibried tumor, or for that matter benign tumor of any type, gallstone, kidney stone, the physiological changes of involution in uterus or breast, the Rontgen rays, the sunshine, keratoses in the skin from age or drugs, all are

followed fairly frequently by cancer. Hence we must educate the layman to avoid continued irritation of all kinds.

Wilson and Willis at the Mayo Clinic showed that in a very large proportion of the cases, cancer could be traced back to displaced cells which showed a tendency to revert to the embryonic type. Such displaced cells are to be seen in the chronic ulcers of the mouth and stomach, in the obliterating appendix, in the diverticula of the intestines, all of which should be removed if they cannot be promptly cured They found evidences of previous isolation of epithelial cells in three per cent of the rectal cancers, ten per cent of cancers of the cacum, thirty per cent of those of the lip, thirty-three per cent of those of the gall-bladder, forty per cent of those of the colon, sixty-seven per cent of cancers of the stomach, and one hundred per cent of those of the appendix. The regression of the uterus and breasts gives the same conditions; the inflammatory processes in the prostate do the The hypernephroma is a group of prenatal isolated cells All these show the same tendency of isolated groups of epithelial cells to run amuck. If we appreciate these conditions as leading frequently to cancer, then we will treat these primary conditions more carefully, and if necessary eradicate them by excision or some other means before they become cancerous Bloodgood states that of the pigmented moles which have undergone cancerous degeneration and then been onerated on he has seen sixty-five cases, and not one has had a permanent cure. Yet how easy it would have been to remove the pigmented mole before its degeneration certainly if a mole starts to degenerate its

immediate cradication is imperative.

As precanerous conditions in the cervix uteri, may be considered the unhealed lacerations that are bathed in an irritating secretion. If these locerations are kept clean and uniritated certainly some of the cancers would be avoided. On the penis, the tight foreskin, with its retained secretion, is very frequently evident as a precanerous condition. In the stomach, any ulcer that does not heal promptly under medical treatment should be removed rather than allowed to drift on until

the evidence of cancer development is obvious and the prognosis hopeless.

As to the effect of trauma, Theilhaber found one hundred and forty-eight cases of carcinoma and three hundred and twenty-four cases of sarcoma that followed an injury. More than half of the sarcoma cases developed within six months from the injury. Practically all of the carcinomata were in the breats, while many of the sarcomata were in the extremities. Hence we are warned to watch the traumat and tell the patient to do the same and report if the bump does not prompt-

ly go away. The laity must be educated to feel that cancer is preventable and also curable if treated radically and early, that the diagnosis must come from the physician and not be delayed until it is evident to the patient work that has been done in education on the subject of cancer in Germany, started by Dr Winter and adopted by a number of medical societies in that country, has spread through ten other European nations and to parts of the United States Winter assures us that the fear lest the patient and the public be come overanxious in dread of cancer is groundless, as the physician's advice is complete assurance Our tuberculosis work shows similarly that the dread of a disease is not increased by judicious education Winter has planned an educational campaign covering the training of the medical student, postgraduate courses in cancer diagnosis and treatment, medical press notices (especially insisting on the results of cases where the early diagnosis was overlooked), health authority publications of leaflets for physicians and midwives, prosecution of all persons treating cancer who are not qualified physicians, and education of the public to the idea that cancer is carable New York city has adopted a leaflet, "What every woman should know to prevent death from cancer of the utcrus" The effects of this educational campaign are

already being felt in Europe, where the operative statistics show an increasing proportion of operable cases coming for diagnosis and treatment, and therefore higher percentages of nermanent cures.

SUMMARY

We all recognize that our cancer operations are too late, too limited, and often on too local a diagnosis, and that the people have the well-founded idea that our cancer operations in general are unsatisfactory and do not cure

To get better results we must enforce certain well-established conceptions, that early eradication is at present the only rebable method of treating cancer, and operation in general the most satisfactory method of eradication, though energetic caustics and radiotherapy have their distinct fields. That painstaking diagnosis to select the cases suitable for curative operations, complete eradication at the primary operation, with he minimum manipulation, will allow fewer recurfences.

To get earlier cases for operation we must educate the medical student in the medical school to appreciate the importance of early diagnoss and prompt radical treatment. We must educate the practitioners through the medical journals to the prevalence of cancer, so that their eyes will be open to seek an early diagnosis in cases with the slightest suspicion of cancer, or even in the prolonged troubles of many types that have not yet raised the suspicion of cancer. And we must educate the women to seek routine semiannual examinations of breasts and uterus at the hands of their accordingers.

To get our best results we must educate the layman to avoid persistent irritation, and the physician to keep constantly in mind the precancerous conditions and treat them so efficiently that the observable cancers never develon.

A POSSIBLE FACTOR IN THE CAUSATION OF CANCER

MUNITY AND IMMUNITY. DEMINERALIZED FOOD. A CANCER PARASITE

By HORACE PACKARD, M. D., BOSTON Professor of Surgery, Beaton University, Surgeon Managements Homomopathic Hospital

THE following theories and conclusions are the result of many years observation and study of tumor growth, both in the vegetable and animal worlds

Laboratory investigation and experimentation have signally failed to throw much light upon the nature, causation, or mode of transmission of malignant disease. We are practically as helpless to-day in the treatment of cancer as were our forelathers of one hundred years ago; and we are face to face with the momentous laet that malignant disease is increasing at an appalling ratio.

The United States census of 1910 announced for that year 75,000 deaths from cancer, an increase of 8,000 oter 1908, a rate of increase of 4,000 a year. At the present writing there are about 225,000 cases of cancer in the United States of America.

In New York State there have been 8,000 deaths from cancer in the past year Singularly the lowest mortality rate is in the maritime districts—78 to the 100,000—while in the western districts it reaches 105 to 100,000. There were 3,000 deaths from cancer in 1891 and in 1911 there were 8,000. In the later years there has been an increase of 500 a year, which is much greater than in the earlier years.

BRIEF CONSIDERATIONS OF CERTAIN WELL-

- Cancer is a disease of civilized life, and, for some reason not yet understood, it is more prevalent among the well-to do and wealthy nortion of the population
- 2. Primitive people do not have cancer, or to so slight a degree that it is a negligible quantity. As far as known the American Indian, prior to the advent of the white man and civilizing influences, did not have cancer. The Eskimo still lives as he has for countless generations, uninfluenced by modern life—he is practically cancer free.

All races and tribes, upon whatsoever part of the earth's surface, who live a simple life, subsisting upon the natural products of the soil, whether of vegetable or animal origin, unmodified by civilized methods of manufacture or cooking, are practically caneer free,

3. All efforts to graft cancer from a cancer patient to another individual or to lower animals have failed, although autografting, i e grafting from one part of the patient's body to another is easily and successfully accomplished, therefore it may be stated that animal tis-uses in a normal state are immune

to cancer
Experimental grafting of cancer from one
human being to another is hedged about
with such strenuous ethical objections that
really no reliable knowledge exists upon the
subject, except that such desultor; tests as
have been made are all negative. Moreover,
surgeous, play-sicians, and nurses, who in the
ordinary routine of their work deal frequently
and over long periods of time with cancer
disease and cancer discharges, so rarely
deed open cancer in their own bodies that a
predominating vigorous immunity must be
accepted

- 4 Approximately averaged, one tenth of one per cent of civilized people have cancer For some reason as yet unknown, their resistance to cancer disease is lacking or has been lost
- 5 There is some evidence that a small percentage of apparently hopeless cases of cancer, in some as yet unknown way, regain sufficient resistance to subdue the disease and recover.

The lower animals in a wild state do not have cancer, or so rarely that it is a negligible quantity and has largely escaped observation. On the other hand, animals long in capitity not infrequently developeancer, and in domesticated animals cancer is an occasional occurrence.

The artificial propagation of trout has long been an established industry. A matter of much concern among trout breeders is the fact that such artificially bred trout develop a tumor which threatens to seriously cripple the industry.

THEORY

Theories are of scientific value only when they lead to or coincide with known or demonstrated facts.

The writer's conclusions, as hereafter set forth, are based upon the theory that all forms of malignant disease are possible only because of absence of or loss of immunity, and the invasion of the susceptible organism by some as yet unknown parasite

SPONTANEOUS RECOVERY FROM SEEMINGLY HOPELESS CANCER DISEASE

Until very recently, such an attitude of forlorn despair has existed in the minds of the medical profession regarding cancer, that anyone reporting a case of recovery from what had seemed a hopeless and inoperable condition was looked upon as a fool or a hanve and the case relegated to the "error in diagnosis" class

About six years ago the writer made an effort to gather statistics of unanticipated recoveries in cancer cases which had seemed hopeless. The following are brief reports of them:

CASE 1 Pattent of Dr. J. Buchonan St. Mary's Hospital, Pittsburgh, Fennsylvana. Sarcoma of the thyroid, pressure stenosis of traches, trachectomy, microsoporal examination verified diagnosis. Case considered hopeless and sent home to be constituted to the property of th

CAST 2. Patient of Dr. W. F. Wangh. Recurrent carcinoma of mammary gland, dark, hard, red masses in the creatrix at several places, accompanied by landinating pain. Patient was seen by several other prominent physicians, who all agreed that it was a case of recurrent carcinoma of the cleaters. She already presented the characteristic days of the control of the same pain the Faradic current was upper of relieving pain the Faradic current was upper of relieving pain the Faradic current was upper of relieving pain the Faradic current was upper of the control of the complexion of the complexion subside, pain crased and the cachectic appearance space way to a healthy color of the complexion

Five years later she was still in good health with no local or general indications of cancer.

CASE 3. Patient of Dr. E. Lackins Carcinoma of crews, foul discharge, bleeding, uterus fixed, patient anæmic, curettement of discased tissue, dagnesis confirmed by microscopic examination. Six months after there were no physical local indications of disease and the general appearance of perfect health. The only after treatment was bi-weekly local treatment with bethylo tampons

Case 4 Pattent of Dr W H Freeman. Case of cancer of uterus, copous, offensive dark discharge, cervir eroded, uterus fixed and surrounded by erudate which filled the pelvis, cachetic, bedridden Consultation with two surgeons resulted in diagnoss of inoperable cancer in last stage and prognoss of death within a very brief period. Microscoppical examination of pieces of tissue from cervir yielded diagnoss of epithelioma. Much to Treeman's surprise, marked amelioration of the present of the properties of the properties of the end of two years both subjective and objective symptoms had disappeared. At the end of four years the condition of the pelvic organs, on careful examination, seemed normal and the pacers of the properties of the condition of the pelvic organs, on careful examination, seemed normal and the pa-

tient's general condition indicated the best of health Case 5 Reported by Dr E R Ahlman Recurrent carcinoma of mammary gland Some fifteen years ago one Mrs F v C was operated upon by Professor Yalmar von Bonsdorff in Tinland, Helsingfor, for breast cancer About a year later she returned to him with extensive cancerous growths involving the scar tissue and the surrounding thoracle wall giving a picture of cancer en cuirasse. He declined to operate again, considering the case hopeless She then went to specialists in London and Paris, who likewise refused to operate At that time she was very weak and run down showing signs of far developed cachexia Case was given up as hopeless Resigned to the apparently inevitable, the patient turned to the Church for consola. tion and preparation for death. There came, about this time, a turn for the better, the general condition improved, the recurrent nodes shrank away, and finally full recovery followed No treatment during this time

CAST 6 Patient of Dr. Walter Wesselhoeft, Large, nodular, flattened tumor in the rigisatrium reaching from under the xyphoid cartilage nearly to the umbilities. Very tender to pressure, caused nausea and faintness, great debility, emaciation, and sea and faintness, great debility, emaciation, and the season of the control of the succeeding months it was distinctly apparent that the tumor was duminishing in size and less tender, and that there was a corresponding improves the control of the contro

to be up and about all day and enjoy life with the exception of occasional attacks of facial neuralgia.

CASE 7. Patient of Dr. I'. S. Smith. Case of recurrent tumor of the right axillary region, twice operated on. Expert opinion was now sought with the advice that the tumor was mahgnant and amputation at the shoulder joint was necessary. The patient was unprepared for such an ordeal and begged for time to get his home affairs in shape. At this time the tumor was about the size of the fist, the patient was anxmic, had night sweats, and was generally debilitated In the period of waiting he was placed upon a homoropathic drug treatment and rigid regulation of diet. Much to the surprise of all concerned the tumor began to abote. strength returned, night sweats disappeared, albummuria which had been observed ceased, and his general health became normal. The tumor finally disappeared, nothing being left but a cicatrix-like ridge about the size of a goose quill.

Cast 5. Patient of Dr C. M. Boger. Recurrent left mammary tumor, breast removed, recurrence in the sear, development of a bunch in other breast followed by autilary gland involvement. In the succeeding five years Dr. Boger was in close touch with the case and the only treatment was homeopathic medication. The tumors gradually desappeared; symptoms crassed with return to perfect

health.

Case 9. Tatient of Dr. W. S. Sumpson. Bunch in fight breast size of egg, sharp, shooting, burning puns. In preceding two years had been taxe treated with caustic pastes. Had recently consulted three physicians in good standing, all of whom advised operation but give no encouragement as to permanent cure. I rom about september, 1901, gradul improvement over the pastes of the properties of

Gaylord of Buffalo, N. Y., and MacKay of England have also collected lists of more or less complete spontaneous recoveries of cancer cases.

WINTY AND IMMUNITY

Immunity of animal life to malignant disteral, for nearly all efforts to transplant or graft from one human being to another or from man to animal or vice versa have failed, but a significant fact which has not received due weight is that autografting has not failed.

This phenomenon follows the theory of a parasitic cause and loss of immunity just as it should be expected to follow.

It has been and is now a very widely accept-

ed impression among the laity that operation for cancer often results in a rapid dissemination and development in adjacent parts. The medical profession blindly combated this idea, even though over and over again the surgeon saw new nodes of cancer develop along the operation wound and in stitch hole scars. There is at the present time a tacit agreement in the medical profession that operative wounds which open into cancer tissues are likely to spread the disease and implant it in adjacent freshly wounded healthy tissue. So apparent has this become that the modern operative technique for mammary carcinoma, as well as all other forms of cancer, embraces the widest possible dissection, far from the margin of the cancer growth, and removal of the whole mass with all adjacent gland, without cutting into or mutilating the diseased growth itself, lest elements of the disease become disseminated.

Since recognition of this fact of autotransplantation, and the shaping of operative technique accordingly, a greatly diminished percentage of early recurrence has been re-

corded.

Autotransplantation has been experimentally made by Hahn, who engratted bits of cancer tissue from a mammary experiment to the skin of the arms and legs of the same patient. Carmiel reported two similar successes at autografting. Several cases of incidental autotransplantation are on record.

Cripps reported a case of mammary carcinoma where the patient kept the arm bent and in contact with the cancer surface for several months. The skin of the arm near the ellow became the seat of a cancerous uter several inches in diameter.

A similar case of autotransplantation is reported by Morgan Williams, where contact infection occurred of an epithelioma of the

inner side of the thigh to a corresponding

Spread of cancer from one lip of the vulva to the other, one lip of the mouth to the other, one cyclid to the other, one vocal cord to the other, and from the tongue to adjacent parts of the cheek, have been observed. Tapping for ascites due to cancer has been followed by the development of cancer in the puncture

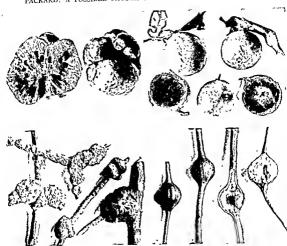


Fig. 1: Rhodites radium: Amphilologs conductives: Andreus punctates: Trypeta solidations: Examples of vegetable tumors caused in every instance by the deposit upon and among the vegetable cells of an insect ovum. From photos by Mas Cora H Clark, Boston

wound, suggesting an infecting agent in the ascrtic fluid

Schimelbach reported a case of epitheliona of the ear. The patient was in the habit of handling it. In this way he apparently transmitted it to his lip. Kaufmann reported a case of epitheliona of the hand. This was apparently transmitted to the eyelid by rubbing with diseased hand.

THE RÔLE OF EARTH MINERALS AND SALIS IN BOTH PLANT AND ANIMAL LIFE

Plant roots appear to have the power of selecting from the soil those chemical ingredients which are necessary for their highest development, and elaborating them and storing them away for growth and future generation

There is a vast impassable chasm between the vegetables and annual worlds, in that vegetables can select and assimilate such imorganic salts and minerals of the soil as their needs best require, while animals must be largely dependent for their food salts upon those which nature throws in their nay through the medium of natural or cultivated food plants and wild or domesticated food animals.

What particularly concerns us is, however, what influence upon a plant's resistance to



Lig 2 Arcentholium pusulium (witches brown: A greatly reaggerated growth on a spruce tree due to purasitu infection by the dearf modelesse.

parasites results from a deficiency of earth salts in the soil. A few yours ago the writer happened upon this fact. In a secluded valley in the state of Maine it came to light that apples grown upon the soil of old stons pasture land reached maturity in a much more perfect condition and freet from worms and insect pests and parasites than those grown in other parts of New Lugland upon land which had been under long cultivation The reason for this did not appear until later Those old and neelected pasture lands were full of glacial boulders and deposits, and had never been cultivated because so rocky and supposedly barren Decomposition of the glacul rocks had been going on for centuries through the process of weathering, with the result that the soil was rich in earth salts and minerals (potassium silica, manganese, calcium, sodium, and iron)

Further study taught that in areas of the country long cultivated and overrun with plant pests and insect parasites, liberal fertilization of the soil with earth salts (potash, phosphorus, silica, manganese, calcium, and iron) augmented the quality and quantity of



Fig. 3. Carenomia queries rubre: A tree cancer found in great abundance among the real oak trees of Cape Cod. Caused by the bacillas phyto-phymilio.

plant growth and fruitage and diminished the ravages of parasites and insect pasts. Further research disclosed the following facts:

1 Food cereals, notably wheat, grown upon the long cultivated and wom our grain tields of central furope yield a product so denicient in earth salts that millers find difficulty in milling it without adding a certain proportion of the grain rich in maneral, form the wheat helds of the western portion of America.

2 The demands of civilization are for wheat flour manufactured in such a way that it will make bread which is white in color little or no thought has been given to the fact that the intrucate process of milling takes away from the product those fond solit optassium, sodrum silica phosphorus lime, manganese, etc., which are also solitely necessary for strong, healthy, virile disease resisting animal files.

3. Along the whole fine of vegetable and animal food products, man is on the losing side in the matter of food salts. In all modern methods of agriculture and dairying fertilizing material rich in nitrogen but poor in earth salts is fed to plants. Dairy animals are fed upon the products of such soil and get in turn food rich in nitrogen and poor in mineral salts. The milk from these dairy animals is again rich in nitrogen but poor in food salts. The redeeming feature in the food material of domestic animals is that they receive largely the flour milk waste products (bran, shorts, and middlings) rich in earth salts, and so these may in this roundabout way finally reach the human family

4 Commonly used methods of cooking are wantonly wasteful of these precious salts Potatoes probably constitute the most widely used article of duet rich in food salts, next to wheat.\(^1\) The prevailing method of coaling potatoes is to remove the skin, soak them in cold water for a varying length of time, and then boil until "done."

With removal of the outer skin a considerable portion of the inner skin is also removed and both thrown away. These portions are the richest parts of the potato in food salts. The subsequent soaking and cooking dissolves a part of what remains, and about one half of these precious salts are thus lost

Rice, next to wheat, is the most widely used cereal food In the milling process or pobsising which prepares it for market all or nearly all the pencarp is removed. This is the part bearing mainly the food salts. Both human bengs and animals languish and die upon a diet of polished rice.

Animal evistence would be impossible without earth salts. Lime and potash in the bones and teeth, phosphorus in the nerves, iron sodium, manganese, and potassium in the blood and muscles, are universal and ever essential elements present in healthy animals

It must further be accepted that, incident to the cellular activity of all organic life in the death of old cells and the creation of new, there must be an unceasing excretion of these organic salts and adequate renewal supply must be available in the daily food. Upon this urnalysis is positive in the constant showing of salts of all the mineral elements of body tissue.

The modus operandi of these tissue salts is little understood but that they must be supplied for the upbuilding of animal structure, in growth and maintenance of strength, vitality, and health in mature years is beyond argument

It is a significant fact and one not to be lightly overlooked that cancer takes its rise in epithelial and connective tissue only. In simple terms epithelial and connective tissue cells are the only elements in the animal body What conditions of susceptible to cancer nutrition or metabolism maintain through one period of an animal's life immunity to cancer, and in another period of its life fail in immunization? Why do the skin cells of the sides of the face the forehead, evelids, nose and lips, of aged persons become the frequent site of enthelioma? May it not well be that in the debility of old age they fail to receive those elements or that element of nutrition which makes for epithelial cell vigor and resistance to cancer disease It is the writer's thought that some one of the food salts commonly found in the food substances of animal life is the life giver and preserver in health and normal formation of epithelial and connective tissue cells Which it may be of the ten or twelve salts and minerals commonly found in the animal body, we cannot say It may be something in infinitesimal quantity which has so far wholly escaped our observation

FACTS IN SUPPORT OF THE PARASITE THEORY
OF CANCER 1

The vegetable world teems with examples of tumor formations, and in nearly every instance a known parasite is the recognized cause ² See Figs 1, 2, 3, 4 and 5.

The writer's thoughts were first turned to a consideration of a possible analogy between the turner and animal tumors by the chance observation during a holiday ramble that the red oak trees of the Plymouth

"The term career a wed on this paper in its broader seese includes a first med remote a red on the paper in its broader seese includes."

Bulletin No 43 U S Dept of Agriculture

all forms on creations as on parcona.

Since these cancer studies were begun some very valuable and convanish work has been done in plant tumon by Dr. Erwa T. Smith
publishers at exterior of the Industry of Plant Pathology of the U.S.
Department of Agriculture Washington hee Crown Gall or Plants
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Figs. 4 and 5. Examples of a vegetable tensor of bacterial regarding logical flowing that the control tensor of tensor of the control tensor of the control tensor of tensor of the control tensor of tensor o

(Massachusetts) forests (see Fig 3) are infested by a tumor growth, analogous in general appearance, growth, metastasis, and fatality, to cancer growths of the animal world

Later, and on traveling further afield, an added stimulus to a study of this seeming analogy was afforded by the parasitic tumors found upon the lodgepole pine trees of the Yellowstone Park

In northern New England the spruce tree is the host for a vegetable parasite (see Fig. 2), the Arceuthobium, which causes great localized broom-shaped overgrowths (witches) broom) that finally kill the tree A characteristic feature 1s great overgrowth of the part or branch locally infected

In northern Maine the spotted alder is a common cone-bearing shrub or tree. While the cones are yet immature, a parasite invades some (not all) of the scales or segments of some of the cones, resulting in elongation and enlargement of the invaded scales to many times their original size cales to many times their original size.

The ergot of rye and other grains and grasses, produced by the clabicets purpure, is another well-known illustration of cell multiplication and overgrowth as a result of parasitic invasion

In fact, in the vegetable world, there is endless evidence pointing to the stimulating effect of various forms of parasitic invasion upon plant cells and the formation as a direct result of tumors (galls and burls) so similar

2 Dwarf mistletoe

in their shape, mode of multiplication and sometimes fatal effects, to animal tumors, that one can but be deeply impressed with their analogy There are plant tumors seen upon every hand, in woodland and along the wayside, and these are in every instance of parastic origin—an insect deposits an ovum cell amongst the vegetable cells with the result now exhibited

I would like this thread of thought to run through your minds, viz, that a living potential cell has been planted among living cells of another kind With the continuation of life of both of these parasitic cells and the host cells. there is an enormous multiplication of the host cells and tumefaction or tumor. The natbological process is identical in both plant life and animal life, and I feel warranted in announcing this influence of a potential cell upon other cells of a different kind as a law of nature, and deductions from observations upon plant pathology (see Figs 4, 5, and 6) are quite applicable to questions in animal pathology which are hedged about with insurmountable difficulties

CELL BULTIPLICATION OR HYPERPLASIA A
COMMON SEQUENCE OF PARASITIC INVASION OF THE VEGETABLE

The pertinent fact which confronts us as a result of this evamination of vegetable parasitism is that in every instance cited there is an enormous local multiplication of cells, in other words, the primary influence of the parasite has been to stimulate the plant cells



Fig 6 Widespread infection of a group of red calin the Cape Cod Forest. Note the clinical similarity to Fig. 7.

to a growth which they never show under normal conditions

Turning now to the animal world do we find a known and well-demonstrated analogous state of matters?

At the stry outset and in the very beginning of animal life we are confronted by the subtle and profoundly stimulating influence of one cell upon another cell of a different kind The ovum is but a cell of infinite potentiality. The spermatic cell stimulates it to segmentation and multiplication beyond the contemplation of the human mind

The blood considered as a tissue exhibits enormous multiplication of its white corpuscles under the stimulus of invasion by pathogenic bacteria

All inflammatory tumefactions whether of staphylococcus or streptococcus origin may be accepted as analogous examples of cell multiplication as the result of the influence of other cells of a different kind

Tubercle, gumma, leprosy, and actinomycosis are all universally known examples of tumefaction and cell multiplication from known parasitic causes

Those tumors of the animal world which



Fig. 7 Author's case of multiple million-surcoma Note the chincal similarity to Fig. 6

are not of known parasitic origin such as lipomatic, chondromatia, admonatia, exostoses, carcinomatia, and sarcomata, present, in a general way, eractly the same characteristics of cell multiplication as we have seen in the vegetable world and in some tumefactions of animal life.

The benign tumor, above enumerated may be dismissed as of insufficient consequence to raise the question of their mode of origin or cause

Of malignant tumors, however, the question of cause is a burning one and is destined to so continue until answered

The microscope has thus far failed to show any micro organism, and laboratory investigation has not yet demonstrated a parasite which the world is ready to accept as the cause of malignant disease

But, casting all this aside, have we not sufficient facts in the natural history of the disease and in the analogy of tumor growth in plants to tumor growth in animal life, to accept, until such time as further investigation shall positively demonstrate, the working hypothesis that all malignant growths in animal life are parasitie in their orietin Here is a case of human cancer (Fig. 7) the initial lesion of which appeared upon the forehead. The next outcropping of the disease was upon the chest. At the time of the dath scarcely any portion of the body was exempt from invasion. In the mind of the writer no theory can so well account for the initial focus of the disease and its subsequent dissemination by the way of the lymphatics as a living virile parasite.

as a long wine perastic.

At the present writing, a case is under observation and treatment from whom, in April, 1970, a small cutaneous tumor developing from a birthmark which microscopical analysis showed to be carcinoma, had been removed from the lower part of the anterior portion of the thigh. A few months later a similar tumor appeared in the skin near the groin; next, another growth developed in the periphery of the left mammary gland. Now there are nodes upon the back, under the arm, the inguinal glands and in or near the cicatrices of early removal, numbering over one hundred.

In May, 1908, a young woman exhibited a movable bunch, superficially located near the lower border of the pectoralis major muscle, near the axilla Removal and microscopical analysis announced carcinoma Later other bunches appeared in the cervical region, in the groins, and abdomen, with subsequent extension to adjacent and distant parts.

These painful cases of local incidence of malignant disease, are so familiar to all physicians that reiteration is unnecessary

WHAT EVIDENCE DO WE POSSESS SHOWING THAT DEPRIVATION OF ADEQUATE SUPPLY OF FOOD SALTS MAY BE A FACTOR IN THE INCREASE OF CANCER AMONG CIVILIZED PEOPLE?

FACTS

r. In the course of natural events upon the earth's surface there is a constant loss of those earthy salts which are essential to vegetable and animal life and health. Every river, stream, and brooklet is emptying them into the sea from which none ever return to the land.

 The land losses are never replenished except from the slow weathering of the exposed rocks of the earth's crust. 3 The ocean is the great reservoir of the earth salfs.

4. As far as is known sea life is free from any disease comparable to the cancer disease of land animals

5 Sea life appropriates to its fullest needs all or any of the salts of the sea.

 Those human beings whose environment necessitates subsistence exclusively or almost exclusively upon sea food are cancer free

7. Primitive people who subsist mainly upon the flesh of wild animals and upon vegetables not at all or but slightly changed by civilized methods of manufacture and cooking, do not have cancer, or if at all in such a slight degree that it is a negligible quantity.

8 People of the lower classes who live upon a very restricted diet, bread, potatoes, and a little meat, all cooked in a primitive way with little or no wasteful loss of salts and quices, suffer less from cancer than the wealthy, whose diet embraces all edible things from all quarters of the globe and prepared according to the ultra refinements of cooking.

9 The most recent word upon the influence of the cereal organic salts comes from the Philippine Islands and the coast of Labrador 1

The almost universal method of preparing rice for market is by a process of milling to remove the outer covering or pericarp. The product is known commercially as "polished rice." Nearly all the organic salts are thus removed. Beriberi as disease of people whose chief det is polished rice. Change to a diet of unpolished rice prevents and cures the disease.

to That we may free the human family from cancer by reform in dietary is perhaps too much to hope for but as physicians and guardians of human health and life, as it not our duty, in the light of present knowledge of their potent influence for health, strength, and vital resistance, to launch a propaganda for reform in the conservation of the food salts in cereal and other vegetable foods? Cereals and potatoes enter more extensively

4 Practical Experience with Benthern and Unpointed Rice in the Philippanes by Verser & Heurer M D., Sembert Caused by FraceWhite Blook, by John M. Lintle M D. J. Am M. As June 87 only. The Fash to Love as Labradov by Dr. Wilfred T. Gerniell. Boston Transcrut, July 2018. into the dictary of civilized peoples than any and all other food articles combined. The demand of the civilized world, in its ignorance, is for bread made from bolted flour—the most important food material bereft of its vitalizing elements; and in its thoughtlessness the higher classes eat of potatoes from which more than one half of the food salts have been removed by refined methods of cooking

11. The writer begs in closing to ask the co-operation of all physicians to strive for reform in the dietary of all people so far as it relates to the conservation of the food salts Proof of the truth of the teachings set form in this paper must be a matter of years. If the public can be convinced that in cating of food which has been robbed of its important life-giving and health maintaining elements they are inviting cancer disease, that greatest of all levers, public sentiment, will bring about reform in methods of manufacture of food materials.

CONCLUDING PROPOSITIONS

In the light of present-day knowledge is the time not now ripe for full acceptance as fact that the active cause of cancer in the human family is some as yet unidentified bacterium, protozoon or fungus?

Is it not a most reasonable assumption that all animal life in a normal state of environment, and supplied with nutriment bearing all the organic ingredients necessary for the upbuilding and maintenance of a healthy resistant vitality, possesses in itself a protective immunity to cancer;

In view of the apparently well-established fact that in the vegetable world an adequate supply of the earth salts (phosphatic, potassic, feric, manganic, silicie, sodic) act as a distinct deterrent upon parasitic life and make for vigorous, virile, discase-resisting, healthy for, may we not assume as much for the animal world?

Since a critical examination of the habits of life of civilized cancer-plagued people, in comparison with the habits of primitive cancer free people shows that the main

difference is in a dietary poor in food salts of the former and a dietary rich in food salts in the latter, is it not the most logical and rational course to adopt this as the keynote to our plan of cancer treatment? It matters not whether the diet consist wholly of animal food or wholly of vegetable food. Eskimo tribes have existed for centuries upon a dietary of uncooked animal food and are to-day a strong enduring, cancer free people There are lower animals without number which live exclusively on the flesh of other animals and are strong, enduring, virile, and cancer free There are wild tribes, in the as yet wild places of the earth, whose diet is wholly of vegetable products These children of the soil are also cancer free. There are lower animals without number which live exclusively upon plant life and are strong.

enduring, and cancer free

It is far from the disposition of the writer to cast any disparagement upon the herculean laboratory work which has been done in seeking for the cause of cancer and searching for a cure. Much of great value has been learned, much more may yet be accomplished; and let us earnessly hope that the long sought for cancer antitoxin or cancer germicide may be discovered.

In the meantume may we not follow the simple teachings of Nature as we see them laid before us in the natural history of cancer disease and nastruct the nations of the earth that if their peoples may hope for strong, disease-resisting bodies, bodies possessing a sufficient resistance to combat the frightful, dreaded cancer disease, a well-balanced dictary must be adopted including not only proteids, carbohydrates, and fats, but also food salts.

Note —Since this article was written reports have reached the writer from Drs. Wilfred T Gern-fell and John M. Luttle who are engaged in masonary work on the Labrador coast, that the introduction of refueed flour and its wide adoption as a lower of the control nature has been followed by many of a control nature has been followed by many of a control nature has been followed by many of a control nature has been followed by many of a control nature has been followed by many of a control nature has been followed by many of the control of the control nature has been followed by the control of the contr

MECKEL'S DIVERTICULUM AND COMPLICATIONS

BY H A BRENNICKE, PR G. W D. MIRORA, HILDOS Surgeon for the C B & Q and C & N R R Arten log Surgran to the St Charles Hountal

TILE presence of a Meckel's diverticuhim is of a frequent enough occurrence and its pathology is so fatal that we should always bear it in mind when dealing with abdominal cases Because of the lack of general knowledge of its presence I thought it would be worth our time to briefly review the embryology, anatomy, pathology, and surgery, and add a few cases to the literature which occurred in my prac-

History. Ruysh in 1701 first called attention to its presence, and Morgagni reported several cases, but John Frederick Meckel was the first to call general attention to it. and to advance a theory as to its origin and its importance as a cause of abdominal affections

Origin About the end of the third week of factal life the primitive gut communicates with the volk sac by the vitelline omphalomesenteric duct (volk stalk) As the abdominal wall closes, this gradually becomes smaller and normally disappears at about the sixth month A persistence of this duct is called Meckel's diverticulum, and in its most perfect form consists of a tube similar in structure to the small intestine, and is patent at the umbilicus forming a fæcal fistula From this perfect form there exists all grades. depending on the completeness of the developmental changes going on in the duct, in some cases consisting of a blind tube hanging free into the abdominal cavity, or attached by a fibrous hand to the umbilicus, mesentery or other abdominal organs This fibrous band or terminal ligament is the more or fess atrophied remains of the omphalomesenteric artery and vein

It is usually stated to be in the lower one fourth of the ileum, but may be found anywhere in the intestinal tract from the pylorus to the ileo caeal valve. This variability can be explained along developmental lines as follows In the earlier state the intestinal tube can be divided into three

parts: the head gut, the mid gut, and the hind The mid gut becomes U-shaped, called umbibcal flexure, and at its greatest convexity the vitello-intestinal duct is attached The upper limb of the umbilical flexure develops into the jejunum and part of the ileum, and from the lower limb the remainder of the ileum, the cacum, and the ascending colon develop. In the subsequent development a retardation of one or the other limb would cause a variance in the position of the Meckel's diverticulum, as a hindrance to the lower limb would cause the diverticulum to be close to the ileo-cacal valve; whereas if most of the development occurred in the lower limb then the diverticulum would be located higher up, and be found in the jejunum or even the duodenum. The position on the intestinal loop is usually opposite the mesenteric attachment, but may be found on the side or even arising from between the two lavers of mesentury

Leneth: The length of the diverticulum varies, as before stated, according to the degree of involution of the omphalomesenteric duct, and may be short and blunt or very long Lamb, in a series of 100 cases found the average length to be about two inches

This is usually like the finger of a glove, but may be constricted at its base or even globular and the communication with the gut closed, forming a cyst. The distal end may be clubbed or divided, or may be open and communicate with the umbilious

Structure. Like the bowel, it has its three coats the mucosa, the muscular, and serous, as well as having the crypts of Lieberkuehn

and Pever's patches

Meckel's diverticula have been found to be the cause of many cases of intestinal obstruction. Leichterstern found in a series of 1134 of obstruction that 6 per cent were caused by Meckel's diverticulum the combined reports of Haven, Duchanssoy, and Brinton, in a series of ooi cases 6 per cent were due to Meckel's diverticulum

The obstruction may be caused in many ways, of which I mention the following:

 Obstruction from a kinking due to the traction by an attached diverticulum.

- It may cause a volvulus of the small intestine by twisting the bowel on its long axis at the point of origin of the diverticulum.
- 3. A chronic inflammation of a diverticulum and adjacent parts may cause a cicatricial narrowing of the lumen of the bowel
- 4. An inversion of the diverticulum into the bowel causing a mechanical obstruction, or by being drawn farther into the humen of the bowel causing an intussusception
- A diverticulum which is attached may act as a band around which the bowel becomes twisted, and cause a simple constriction or a volvulus.

6 A prolapse of small intestine through an umbilical fæcal fistula, or a prolapse of a Meckel's diverticulum into a hernia sac

In reviewing the literature of the cases of Meckel's diverticulum reported, the following facts may be noted. The condition is found in about 2 per cent of the bodies: D. M. Corner of London (1), reports a case in a male child only four weeks old which was patent at the umbitious, and from which faces was expelled. It developed an intussusception and died. The average age of the reported cases which were operated was 15 years old. Males predominated

Symptoms: The symptoms caused by a Meckel's diverticulum vary greatly, depending upon the pathology induced or accompanying it Comparatively few come to the operating table considering that they are found in 2 per cent of the bodies. Many cause no symptoms, or the disturbance is so slight that it is overlooked. Often they have been mistaken for appendicitis or other dis eases, as is shown in the various reports The pain is usually colicky and intermittent, and located around the umbilicus, either to the right or to the left. It may be accompanied by vomiting, and is followed in a fair percentage of cases by bloody stools amount of blood when passed is usually copious and dark A history of previous attacks is often given. Umbilicus often retracted. Usually no fever is present for the

first few days, and the patient's condition is very good considering the severe onset. If any obstruction is present, the usual findings are present, such as tumor, peristaltic waves, vomiting, and constipation.

In "Gray's" case, the condition was good as late as the seventh day. It is often brought on by some more violent exercise. Mayo in a series of 10,600 abdominal operations found a Meckel's diverticulum filtent times. In ten of these it was removed to avoid later trouble, and in the other five it was the cause of the symptoms for which the patient was brought to the hospital.

A E. Halstcad (2) gives a summary of 69 cases of Mcckel's diverticulum with obstruction. Fifty-seven of these were operated with a mortality of 59 1 per cent The obstruction was caused by some form of a band, causing a constriction II Tyrell Gray, London (3), presents a very complete table of forty cases of invagination of Meckel's diverticulum, with various complications Of those in which the results were mentioned the mortality was about 60 per cent The high mortality, I believe, is due partly to the fact that the condition is not always recognized early. and in part because the pathology produced by a Mcckel's diverticulum is often very extensive, as illustrated by Cases 2 and 4 which I will report.

The following cases, which have come to me in the past few years, have all been of different types and of considerable interest:

CASE I Miss L, age 28 years. Brought in by Dr West of Batava, May 28, 1910 History: Born M Sweden Had the diseases of childhood. Eight years ago had the right leg amputated in Chieng for a tubercular osteomyelitis. For many years had a crampy paiss in the abdomen. Never passed and crampy tales in the abdomen. Never passed and cramp tales in the abdomen. Never passed to the control of the contr

On opening the abdomen we found the signoid drawn over into the right side of the pelvis The ovaries and uterus were small. The execum was high up under the liver, and in looking for the expension of the side of the side of the side of the dependent of the side of the side of the side of the deverticulum was filled with gas and it was matter and was constricted at the bowle end so as to act as a valve. There were adhesions around it, which were loosened, the diverticulum was removed, and the bowel opening closed by two rows of sutures. The appendix was looked for and removed, though lound normal. The pritient made an uneventilul recovery, and reports that she has lelt fine since the operations.

CASE 2 f D, male, 6 years 6 months Home in Kansas, and while visiting his grandparents in Aurora, and taken sak free new health good The day before I was called, he had exten several apples and was wrestling with other boys. Late in the afternoon he got severe cramps in the abdomen, which his mother ascribed to eating green apples, and he was given a player. The pring continued through the night and I was called the following morning. fle gace no history of ever passing blood, or bacing had previous attacks lanmination showed face pale and pinched pulse 140-150 weak and thready, and temperature nermal. Heart and lungs negative Abdomen In the region of the bladder was found a large cacilling dull on percussum and moderately tender. He had passed very little urine and by ratheter very little urine was obtained. The urine was dark and contained nrither eight not albumin I made a diagnosis of a probable volvulus and advised operation. A consultation with Dr. Villbacher was held and advice repeated but owing to the absence of the father who was in Kansas an operation was not allowed until the following day

The princit's condition at this time was very bad. On opening the abdomin we found the bowel black and distended. The gaing mass conditions extended from the crumin practimistical based. In this condition for this was resisted the colon foosificant a literal arritemous by the suture method on. The patient was in had condition through

out the operation and dud tockse hours fiter CASS 3 1, made, excess old Tatent of Dr Schiller ol Big Rock. Grees history of havee hist aimfur attacks before in which he present attack begins with severe pun in the present attack begins with severe pun in the does of exator only part of history has been done of the part of the part of the dollowing dry he had another attack of severe pun hasing several hours after which his bone had donot move. On the thrad day had been dealer in consultation. A disposses of an in was called in consultation. A disposses of an in outs the house had a feet and the pattern brought into the house hours of the pattern brought.

The abdonces as opened by a median nucson Tenty-five or thirty inches of small bowed were lound very much dilated and covered with black patches the size of a dollar. A mass was found buch a patches the size of a dollar of mass was found buch when the most incarcerated, and was brought out with difficulty. A loop of about five inches was intussuscepted and was gangerous. This was recected. An end-to-end anastomous was made with a Murphy button, and the abdonce doued devertigation, which had become invogleated into the bowel and was grangernous. The invagnated Meckel's directioner no doubt caused an increased perustalisis, causing it to be drawn farther into the lumen of the bonel, producing the introvuception. On the fatth day, the patient passed the button and left the bospital on the circenth day. Unon the majoral in Jan Scannel from the mother that the button passed unasseable arisk the button passed unasseable arisk that the button passed unasseabl

Case a Baby S. miletany, early sid. I wall speak of this size because of a very blurt duesticulum in the lower sleum, and a very long appendix in an intussive septime. The size of fauters, lowa, April 28, 1912 Br. Alsson was called to see the laby, on account tol severe abdomnal pair. Week privious it had a rind attask of pair. Week hours before the serond attask the child but passed a perfectly anomal lowest movement. Went ore and a hill mormal lowest four effects of the pair he prived about we of three wants and the distribution of the prival size of the size of the prival s

On examination Dr. Nilsson detected peristaltic waves and a sausage shaped tumor in the left side. and made a diagnosis of intusciprention. He advised immediate operation and came to Autora with the child. A the time of entering the bo-pital the pulse was rapid and weak, the skin which had always been of very good rolor, was pale, and the figs were blue A median incision was made, which had to be extended above the umbilious abdomen was tilled with a scrops fluid, and the tumor mass was found to be the colon, and extended across the upper part of the abilomen and down into the lett side. Micr delivering it to the outside and tinding it impossible to reduce the intussisception without tearing the bowel, we clamped it at both ends and desected it out. The condition of the bain, being very bad, we made an anactionous by means of a Mutphy button but it lived only a len

Examination of the specimen showed it to consist of about three inches of the lieum, and twenty inches of colon. The appendix was about three inches long, and near it was a cupping in the intestinal wall. It was impossible to reduce the intussusception without tearing the bowel, which was found to be gangerous for about ten inches

The above cases have been of considerable interest to me, because of the comparative arrily of Meckel's diverticulum, and because each case has been different. In Case 1 it simulated an appendit both in symptomatology and also findings at the operation. The diverticulum contained faced matter and gas, which is an unusual finding according to the literature that came to my notice

In Case 2 the diverticulum caused a volvulus which resembled an extremely distended bladder. The onset was very sudden and very severe, so that even a casual inspection of the child gave one an impression of collapse His color was bad, the expression anxious, and the pulse thready, though the pain and tenderness at the time were not much

Case 3 was more typical of the average run of Meckel's diverticulum with intussusception. There was the severe colicky pain followed by vomiting, which became fæcal on the third day No blood, however, was passed In this case, besides having the Mcckel's diverticulum invaginated and having the bowel intresuscepted, the whole mass was incarcerated quite firmly in the right upper quadrant of the abdomen

In Case 4, as in Case 3, we had intussusception, but involved chiefly the large bowel The blood was passed about one and a half hours after the pain, which was no doubt due to the fact that the intussusception reached down into the descending colon, and was tightly constricted, the bowel being absolutely gangrenous

Since reading this paper at the Fox River Medical Association I have operated on another case which I will include in the report

CASE 5 Mr I 25 years old Brought in by Dr Thompson of Sandwich, Ill, with the following history He had no bowel disturbances until seventeen years of age and since then has had five attacks, feeling perfectly well in the intervals. Nine months ago he had an attack with colicky pains and bloody stools which kept him in bed for two weeks. After that, he was perfectly well, and worked on the farm until three days ago, when he again had the colicky pains and bloody stools. The pains

nere sudden, to the left and above the umbilicus, and felt like gas through the bowel down along the left border of the abdomen until they seemed to reach the rectum, where it felt as though they met with an obstruction and produced severe pain The pain lasted all afternoon, and in the evening he passed a large quantity of blood. The next morning he felt perfectly well. In the afternoon he again had the pams, and in the evening passed more blood At the time of entering the hospital he was feeling perfectly well, but was still passing dark blood in the bowel movements. He has had no stomach symptoms, no comiting, and no tumor could be felt Rectal examination was negative A diagnosis of a Meckel's diverticulum was made, and operation advised, which was done the following

Oberation A median incision was made Meckel's diverticulum was found about eighteen inches above the ileo-carcal valve, attached opposite the mesentery It was about the size of an average thumb, two inches long and very much constricted at the bowel end It was clamped, excised, and the bowel closed by two rows of linen suture. The Meckel's diverticulum was filled with dark blood, hung free, and showed no inflammatory changes On its surface was found a white cord like ridge which resembled a remnant of the vitelline duct The mucosa was very redundant, thick, white in color, fairly hard, tough and elastic like cartilage In tracing the bowel down to the excum we found a Lane's Link about three inches above the ileo-creen! valve which formed a very acute angle, with the convexity hanging downward. The Jackson's membrane which supported it was a dense fanshaped structure about five inches at its base. This was dissected off and ligated

The appendix was six inches long, with several facal stones, but showed no inflammatory changes, This was removed and the abdomen closed without drain The patient made an uneventful recovery.

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DEPARTMENT OF TECHNIQUE

A CASE OF EXTENSIVE SUBCUTANEOUS EMPHYSEMA FOLLOWING INTRATRACHEAL ANÆSTHESIA, WITH RECOVERY:

BY H. CLIFTON LUKE, M. D., NEW YORK CITY Anasthelist to St Luke's Hospital

ATE S, age 36, was admitted September 14, 1912, to St Luke's Hospital, with a charnosis of tumor of the cerebellum Aside from symptoms immediately referable to the tumor, her general physical condition was satisfactory, the lungs being clear and the heart normal. An exploratory operation in the occupital region with a decompression was performed by De Walton Martin on September 16th, with intratracheal anaesthesia

The patient was easily anæsthetized with gas and ether (Bennett apparatus being used), and was readily intubated at first that without apparently the slightest traums, using a No 24 Fr lisle-thread catheter, and Jackson's direct vision laryngoscope. The catheter was stiffened slightly by use of cold water, as an aid to intubation. It was intended to keep the manometer pressure at 20 mm, of

mercury

It was necessary to place the patient in complete prone osition, with the head strongly flexed over the end of the table, a very bad breathing position for any patient There was considerable chance for the displacement of the catheter while the patient was being arranged in this position and draped, and in order to protect the aniesthesia in this regard, the usual close observation of the apparatus, especially the manometer was necessarily somewhat neglected for a brief time. The draping practically excluded any view of the face, and with the assistants close around the head, it was next to impossible for the anesthe-tist to make any satisfactory observations. The operator agreed to watch the color of the blood for cyanosis, and a nurse was instructed to frequently observe the pulse

The patient was quiet, of good color, and the operation was started It was early observed that the air was not passing through the ether with the usual freedom, indicating that the intrapulmonary resistance was excessive, but the color and pulse were entirely satisfactory for the first ten minutes. During the next twenty five minutes all went fairly well except that a moderate cyanosis developed occasionally, which was relieved by extending the head a The pulse was now about 120, and the general condition was less satisfactory About ten minutes later the blood in the wound was noted to he very dark, and the face, which was inspected at once, was cyanosed and generally swollen, especially on the left side. The intratracheal tube was withdrawn without a moment's delay, and the patient quickly turned to the dorsal position and artificial respiration begin. A more carried examination now showed that, aside from the face, there was also marked swelling as far down as the umbilious, anteriorly, and to the base of the spine, posteriorly, all of which gave the characteristic crackle, on palpation, of subcutameous emphysema

The pulse now was 160, and the patient looked moribund. a gasping respiratory effort occurred about four to six times to the minute After a few minutes of artificial respiration the color began to improve, and the respirations increased to ten to the mnute while the breathing became Chryne-Stokes' in type Then, in a latero-prone position, with a very small amount of drop ether, a decompression was rapidly completed On leaving the operating room the pulse was rao and of better quality, the color was good, respections were about twelve to the minute, body was rather cold and clammy, and the emphysema was un-

changed

During the next three or four days the emphysema mostly disappeared, rather rapidly from the face, but slowly and never completely from the body There were no signs of pneumonia or bronchitis at any time, and no laryngitis or sore throat Her condition was so satisfactory that on October and (sixteen days after the first operation) an attempt was again made to locate the tumor, the decom pression having but little relieved the pressure symptoms The position was prone, and a successful anesthesia was carried out with the use of warmed other, vaporized into a partially closed mask, and pharyngeal tubes introduced to prevent obstruction She died five days after this second operation of traumatic cerebritis. There were no pul-monary complications. Unfortunately an autopsy could not be obtained, but it is interesting to note that some emphysema still persisted about the base of the spine when she died

The following possibilities may be considered in explanation of this accident.

First, that of direct trauma due to the catheter, either during introduction or afterward. Again, from pressure of the long, narrow sand bags under

the neck

Secondly, trauma brought about by overdistention. Here is considered the possibility of inserting the catheter too far, and thereby plugging tightly a bronchus, leading to overdistention and runture of the lung. In this case perhaps obstruction was possible from the extreme flexion, and pressure of the sand bags beneath the neck. Again, the catheter may have been too large (No 24 Ft. was used), but from experience this seems unlikely.

This is the second accident of this kind that 'Read before the New York Somety of Amesthetists, December 20, 1012

has occurred in this city during the use of this method. The other case resulted in death, and was thought to be due to the catheter slipping into a branchus and plugging it, with consequent

excessive distention and rupture of the lung.

In closing this report it is admitted that errors in technique may have been entirely responsible

for this accident; but it teaches the valuable lesson that the method is not entirely without danger, and, further, that a safety device (which was not applied to the apparatus used in either of the above cases) which will efficiently guard against high intrapulmonary pressure is absolutely essential.

A SUGGESTION TENDING TO SIMPLIFY AND MAKE MORE ACCURATE THE CLOSURE OF THE POSTERIOR EDGES OF THE WOUND MARGIN AFTER EXCISION OF SADDLE ULCER OF THE STOMACH

BY ESPY M. WILLIAMS, M. D., PATTERSON, LOUISIANA

TMAT the operation of gastrojcjinostomy alone has no permanent effect upon ulcers situated at a distance from the pylorus is a well-accepted tenet. These ulcers should be exceed There is also a widespread movement tending towards the excision of all chronic ulcers of the stomach, wherever such excision is technically possible, owing to the recognized tendency of such ulcers to take on malignant changes

Though uniform success has so far been attained by us in ulcer excision, the writer has frequently heen put to a greater or lesser degree of trouble in saddle ulcer in closing the wound margins on the posterior wall of the stomach, depending upon the area of tissue excised. The method heretofore pursued has been that of bringing together the margins of the wound with a running suture of catgut, taking up all the layers of the stomach wall, beginning posteriorly at the lower angle of the wound and ending at the lower end of the anterior wound Over this is then placed a continuous suture of linen, approximating the peritoneum in the usual way, beginning and ending at the same points as in the first layer In the placing of this last suture it has been found difficult in several cases to rotate upward and forward the posterior wall of the stomach for the purpose of accurately reaching the wound margin This should begin a little below the first layer, in order to carefully protect from leakage at this lower posterior angle especially

In a case recently operated and in which a saddle ulcet 4 cm from the pyloric ring was excased, the following procedure was employed with successful issue: Clamps were used, and a goodly margin of tissue allowed around the indurated area. The posterior wound lips extended well downwards, a little more than one half of the

stomach diameter being involved. With double tenaculum forceps the lower angle of the wound was held, and with a similar instrument the margins of the wound were approximated at the lesser curvature. A running lock stitch of No 2 plain gut was now placed, heginning at the lower angle of the wound and taking up all layers of the stomach, ending at the lesser curvature, where it was tred and allowed to remain This completed. slight upward and forward traction was made along this line of suture. Now the second suture was begun, consisting of medium weight linen, commencing slightly below the lower extremity ol the ridge made by the first layer, and passing from side to side of this ridge, in continuous mattress style, from the starting point to the lesser curvature where the first layer ended, This was not tied at its upper end, but the needle passed through so as to emerge on the peritoneal surface, and the thread allowed to remain long for subsequent use During the passing of this layer the finger of one hand was held behind the stomach as a guide. The approximation of the posterior wound margins now having been completed, the end of the catgut suture which had remained was picked up and the anterior margins brought together after the usual fashion. This in turn finished, the long end of the linen thread was used again, and the peritoneal surfaces of the anterior stomach wall were approximated by a continuous Cushing suture passed in the usual manner.

It will be seen that the usual method has been utilized throughout, except that on the posterior surface the peritoneal apposing suture passes through all of the coats of the stomach, being passed from the inner side, which greatly simplines the placing of this layer. It has been

shown by numerous observers that while theoretically such a suture is contaminated by the contents of the viscus, practically and clinically such contamination may be disregarded, more especially when dealing with the stomach. As far as we are able to accertain, this method is original with the writer. It is submitted that the introduction of the posterior peritoneal apposing suture is by this means facilitated, and by this fact that a greater surety against leakage from this part of the wound, the most troublesome to handle is to be had.

EXPERIENCES WITH INTRAVENOUS ANAISTHESIA

PRELIMINARY REPORT

Bi WILLIAM FRANCIS HONAN, M. D. NEW YORK CITY Attending Surgeon to Metanged two Hospital

J WALES RASSLER, M D NEW YORK CITY

Ambiant Surgeon Metropol tax 11 apreal ("URGURY of to-day has made rather exact ing demands upon the anasthetist, the operator insisting upon a period of stable annesthesia of indefinite duration, with complete relaxation of the subject, minimum risk, freedom from post angethetic nauses and comitting, and finally the absence of the more severe complications in the post-operative stage usually ascribed to the anæsthetic. Lven the layman, with an exaggerated idea of the safety of modern surgical procedures, usually disregards the potential factor in operative risks, but almost invariably raises the question of danger from the anasthetic when about to submit to operation builed demands have created the "specialist in anarethesia," whose energies in the past few years seemed to have almost exhausted the possibilities of their art as to agents and methods and in the development of appiratus, each time returning to the point whence they started in 1846 - the administration of other Of the newer methods, rectal anasthesia had but little to commend it and was soon disregarded. Spinal anasthesia,- even though espoused by enthusiastic advocates in this country and demonstrated by distinguished confrères from abroad, has not been sufficiently convincing to give it a prominent place in the armamentarium of the American surgeon.

It has been pointed out by Heautt (1) that "General answhesis, with its attendant unconsciousness of all of the surroundings of a surgest operation, is immeasurably perferable to local or regional apasthesia, and it is to development in the former system, rather than in the latter, that attention should be devoted if the scence is to be brought to its legitimate level." Notation

standing that intravenous anasthesia has been practiced in various climes abroad, the procedure has not appealed to our anasthetic specialists, who probably considered it either a method of

doubtful utility or the passing lad of the moment. Experience, however, shows that this method possesses undoubted advantages, and while not in any way advocating the intravenous route as the usual method of inducing angesthesia, its claims for use in certain cases and conditions cannot well be gaineard. By the indirect or respiratory method of anasthesia, volatile agents are employed which enter the blood in a volume or docage which varies with the depth and energy ul the respirators act, with the degree of accidental spasm of the muscles concerned in the act of breathing, and the ab-orptive power of the bronchial mucous membrane This method does not produce a smooth, even narcous, as the factors utilized are subject to much variation, and the amount of anasthetic used must always be in excess of what is actually required to produce

the result in any given cave. The excess of anexabetic is thus stored up in the body to be gradually eliminated, a process requiring some days, and not until the organism experiences some deleterous effects of the retained drug. In the employment of intravenous anexabes as the agent is directly introduced into the follow, a minimizat amount is used, it is maintained there at attended there are approximated to the store of the control of the control of the control of the patient of the control of the control of the patient of the control of the co

naturally, the color of the skin remains good, and the relaxation and flevibility of muscles are absolutely satisfactory to the operator. The degree of narcosis can be maintained to a nicety, and at the completion of the operation the patient often answers questions rationally before leaving the operating room, and returns to bed with better physical signs than before the anæsthetic was administered.

It cannot be too strongly urged that, for the successful induction of this form of anæsthesia, very careful attention must be given to what are apparently trifling details of the technique. The failure to recognize this fact was the reason of only partial success in the hands of some of our

interested confrères

For the intravenous use of ether the patient, having been prepared, is taken about forty minutes before the time for operation to the anæsthetizing room and placed preferably upon the operating table which is to be used during the operation A subcutaneous injection of scopolamin gt 1/100, atropin sulph. gr. 1/100, and morphin sulph gr. i is given in one dose, in the loose tissues of the chest or abdomen. From this time until the actual angesthesia is accomplished it is extremely advisable to keep the patient as quiet as possible, so that its administration is begun with the patient in a condition of reposeful relaxation of mind and body This precaution materially shortens the first stage and induces prompt anæsthesia with the least amount of solution. and economy in this direction is much to be de-

Our first experience was with ether, using the simple infusion apparatus as recommended by Burckhardt (2), the originator of the method, but subsequently in all administrations, we used the more elaborate and satisfactory technique of Road (3). A five per cent solution of ether with filtered sterile normal saline solution at a temperature of o6" is poured into a reservoir which has a capacity of 2,000 cc and which is adjusted on a stand eight feet above the floor level, at which point it remains during the administration. The fluid flows through an indicator (which contains a pipette), then through a warming chamber into a blunt cannula, and so into the vein. The indicator consists of a cylindrical or globular bulb of a capacity of from 2 to 4 02, with an inside pipette, very much as used in Murphy's apparatus for protoclysis. When the apparatus is working properly, the lower half of the indicator is filled with solution while the upper half contains air. The solution flows from the tank through the pipette and drops on the

surface of the fluid in the lower half of the indicator. By means of a compression tap placed helow the indicator, the rate of flow can be accurately controlled, and if the fluid in the bulb is kept at a proper level a satisfactory index is furnished as to the rate at which the solution netres the vein As ether bools at 9.8.%; it is very important to keep the solution below that point, as the agent is so volatile that it usually vaporizes and examples if the temperature is raised even for

an instant above 96°. Usually the arm furthest from the operator is selected and bound at the wrist to a padded splint, which extends under the body to the opposite side, the weight of the body holding it in place Or the arm may be bound lightly to a splint extending from wrist to axilla and resting on a table of convenient height. This effectively prevents flexion of the forcarm The bend of the elbow is wiped with 5 per cent solution of thymol in carbon tetracbloride, which is preferable to the usual todine application, as it is more effective as a disinfectant, and as it does not discolor the skin, the position of the vein is easily determined. After anaesthesia of the skin is induced by a o.c per cept solution of cocaine, the median basilic vein is exposed through a small incision one half to one third of an inch long, and a double catgut ligature passed beneath it. The distal one is tied and the ends left long and handed to an assistant, who uses it as a tractor. By lifting on both ligatures, the vein is lifted from its bed and with scissors is incised through about one half of its diameter. Into this opening in the vein a blunt cannula is introduced and tied with the provimał ligature

The solution should be administered at a full flow at the beginning, the anæsthetist reducing the stream at the appearance of the usual signs of surgical anzisthesia. It is quite incumbent upon the anæsthetist to take the usual precautions to secure and maintain an unobstructed air way and efficient respiratory act, as with the usual method of anasthesia Ether is rapidly eliminated by the lungs in this method, and, as is true of all methods, efficient respiration prevents accumulation and tension in the tissues, increases its output, and lessens its toxicity. In from one to five minutes anæsthesia will be complete and the operation may proceed Oozing is more noticeable perbaps in the operative field, and with this method, if the cavity of the abdomen is the seat of the operation, fluid rapidly accumulates there. If extensive adhesions are to be dealt with, the fluid becomes blood-stained, and there might be instances where this might embarrass the operator. But we have not been so troubled. The partient may be brought from one degree of anasthesia to another very rapidly by the judicious use of the control indicator, and it is well that the operation be entirely finished and dressings applied before the administration, which as been continuous, is stopped, as the patient returns to consciousness very quickly.

The employment of ether in this way seems almost devold of danger, either from immediate or remote complications, notwithstanding the fact that the infused fluid must be kept at a temperature lower than 98 6. We have had no case of chill or fever follow 1,800 cc administered at a temperature of 96 This is about the only essential precaution in the intravenous administration of either in the property of the control of the c

Having been successful in a number of cases with ether, our attention was directed to the we of hedonal in 530 cases reported by Fedoroff (4), collected from three Russian clinies. No death attributable to the anaesthetic occurred in any case, though eight cases of respiratory arrest occurred, which yielded to methods of artificial

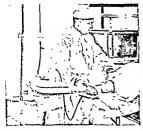
respiration.

Hedonal, or methyl-propyl-carbinel urethrane, is a white crystalline solid stable powder, soluble in water at a temperature of 100. In doess from 15 to 30 grains it has been very successfully used as a pure hypnotic. It is, to some cettent, a diurette, does not depress the action of the heart, and in lethal doess destroys like by respuratory arrest. No fatabities attributed to the use of hedonal as an hypnotic have vet been reported.

For the induction of anasthesia, the drug is dissolved in a normal saline solution at a temperature of 70° to make a 0 75 per cent solution resultant fluid is filtered and brought to a boiling point, we prefer not to boil five minutes, as recommended by Page (5), as some of the efficiency is lost by volatilization of a certain amount of the compound due to prolonged boiling The tank is filled, and when ready to begin the fluid should be about 115°. The same method as used with ether is employed, the fluid being allowed to run in rapidly. Greater caution is necessary with hedonal than with ether, the effect is much quicker, and on the appearance of signs of deep narcosis the stream is reduced until it flows guttatim from the pipette in the indicator. The patient quickly becomes drowsy, the face flushes, or, if the flow is too fast, may be slightly cyanotic, the pupils usually contract, the muscles relax, the corneal reflex is absent, and the patient seems to be in a condition of sound normal sleep without the noisy respiration of an anaesthetic. Ob-

servation of the corneal reflex determines the rate of flow, which after a little experience can be regulated to the satisfaction of operator and anasthetist For operations lasting from 15 minutes to one half hour the patients often wake quite promptly, but with larger administrations they may sleep six to twelve hours, during which time they may be awakened, but they readily fall asleep again The blood pressure always falls with the use of this drug in this way, and in one of our demonstrations before the Society of New York Anasthetists we purposely selected a case with a very high blood pressure (186 mm.), which promptly came down to 142 mm, and so remained for several days after operation In all we have had 51 administrations without a fatality and without a complication worthy of mention, a transient diarrhoea in our very first ether case, and a slight bronchitis in a frail subject after the removal of a colloid goitre weighing nearly two pounds. The class of cases has been those that have come in ordinary general bospital service. iaparotomies for uterine fibroids, pyosalpinx, ovarian cyst, appendicitis, uterine suspension; hernia, joint resections, arthroplastics, amputation of thigh, hone plating operations, plastic operations on cervix and perineum, removal of laryngeal growth, goitre, operations for varicose veins, and castration The case of ovarian cyst was noteworthy, a woman aged 67 had been tapped 36 times The cyst wall weighed 15 pounds, and though some of the contents was lost, ten gallons were actually measured. Ether was used in the case, the anæsthesia was a perfect success, the nationt showing no untoward symptoms at the end of the operation, not withstanding the sudden withdrawal of so much fluid, and the post-operative record was comparable to that

of a minor operation We had one failure with ether in one of the early cases, due to allowing the temperature of the saline solution to be above the required point. One of us (Hassier) prefers ether on account of its efficacy and safety, but the other one (Honan) favors hedonal as possessing most of the characteristics necessary for this form of anæsthesia. It can be sterilized, is stable, capable of accurate dosage, prompt, efficient, reduces blood pressure, and, more important, scems to fulfill the purpose, as expressed in Dr Crile's idea of anoci-association, of preventing cerebral bombardment by shock impulses. There is no question but that the appearance of the patients after operation indicates that this contention is probably true. It has been suggested that the use of hedonal in this manner may be extremely useful in controlling



the convulsions of uramia, particularly of the puerperal type Its sedative action, its power to lower the blood pressure, and the diluting and eliminating effect of the saline, or preferably an isotonic glucose solution, in this instance opens up a field in speculative therapeuties that niight prove of mestimable value

We have also experimented, in two cases, with paraldehyde, but our findings do not warrant its adoption without further experience. Ether has always raised the blood pressure from 2 to 20 mm. while with hidonal it falls from to to 12 mm One case, purposely selected, with a blood pressure of 186 mm, dropped to 142 mm and remained at the lower level for some hours. There have been no evidences of hamolysis other than occurs in ordinary saline transfusion, or in the respiratory method of giving other Hedonal seems particularly well horne and shows no very definite blood changes, but with paraldehyde the microscopic field shows occasional blood cells with marked crenation and pigmented spots in the cell body. In a subsequent paper this part of the subject will be particularly discussed

The time required to produce complete anxithesia ranged from one and one half to twentythree minutes with other, while with hedonal the time was from twelve seconds to four minutes We kept one patient under ether for one hour and twenty-eight minutes, using 2,100 cc of solution (about 3 oz of ether), another with hedonal 175 grams in 1,600 cc. of solution 1 No case of right heart dilation was noted, though the Trendelenburg posture was used in cases for which it is adapted. The cases were marked by absence of nausca and vomiting in every instance, comparative freedom from post-operative pain, absence of thirst, and rapid restoration of functional activities of the body. The mental status. particularly after the use of ether, is markedly clear, the patients are happy, and those who have experienced other forms of narcosts express a preference for the intravenous method of anasthesia

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"Since writing the above we have used a minture of parallelyide age per cent and ether 3 ger cent in normal solition in five cases with very satisfactory results

Z-PLASTIC SURGERY

PLASTIC OPERATIONS TO ELONGWI CICATRICIAL CONTRACTIONS OF THE NECE, LIPS, AND EVE-LIDS AND ACROSS JOINTS

BY STEWART L. MCCURDY, M. D. PITTSBURGH

Professor of Oral Saracry University of Patisburgh Orthopache Surgeon Columbia and Presbyterian Hospitals

T is a difficult problem, in the surgical management of old cicatrices across joints, about the neck, or between the fingers, to liberate the deformed members and control the tissues so as to guard against a return of the same deformity after complete repair has occurred.

The usual method of severing the contracting band at right angles to the line of deformity promises hitle toward permanent relief of the deformity The suggestion that an eyelet be made as a preliminary step before severing the tissue to the margin is not satisfactory All sorts

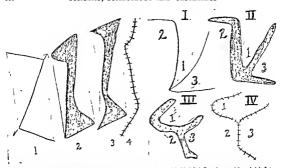


Fig t (t) Line of incision and shaded area showing where skin should be dissected from the other structures (2) Showing partial extension of contracted tissues (3) Showing further extension. (4) Showing complete extension. sion and adjustment of flaps with sutures Observe that the central part of the wound is covered with skin

Fig 2 (1) Modified Z incision (2) and (3) Intermediate position of the flaps as they were shifted from their original to their new position (4) Completed suture



Fig 4 Fig. 3. The Z-line shows the incisions. Mier these were made, flaps A and B were dissected loose back of the dotted lines. The second step in the operation is to take flap B and switch it over into the space left underneath of the state of the second step in the operation is to take flap B.

the mandale on the set sade, as a macrone show Eap A.

Fig 4. Flap A is drawn that and know right B and satured units new position. It will be observed that
Fig 4. Flap A is drawn that do to the symplyon, but finally was natured to the akin immediately over the stemum,
ornspally fap A was of firs B, extensible state-for the stemum, ornspall show a first B of the state of the size mandaled the same mandaled over the stemum, or show the stemum, or show the state of the B. Stemum and tathock to the same mandaled over the stemum, and whole the same mandaled the same mandaled to the same state of the B. Stemum and the same mandaled the sam originary map A was attacked to the symposysts, but finally was suffered to the akin numediately over the stemum, and that the angle of flap B, originally attached to the skin numediately over the stemum, was shifted so as to be suited to the skin numediately under the left angle of the manifolds.

The manifolds are the skin numediately under the left angle of the manifolds.

sulared to the skin immediately under one among or one manning.

Fig. 5 Final result. Thus good man has performed trendly years after the original burn. Notice, in Fig. 5, there Fig. 5. Final result. Thus good the mouth and that the face has assumed an entirely different expression, and that is no inctions owner. The product of the centre currently entire recommendations of the contract of the centre currently is no traction upon the amount the entire circumference



Fig. 9. Burn scar under the arm. Operation by the Z method.

of plastic operations are constantly being done, and some are successful

For bands across joints, as at the elbow, and in cicatrices of the lips, eye, neck, or fingers, the



Fig to Result after complete repair Observe the Z-line of incision across the axillary space

practice is to make an incision along the crest of the band from end to end, care being taken to sperarte the two layers A lateral cut is made at each end of the first, but on opposite sides, back



lygs 6 and 7 represent practically the same operation as shown in the preceding case, with equally good result. Fig. 8 is introduced to show neck creature and ectropium of the lower lip corrected by the Z operation described in the lett in this chapter





Fig 13 Fig 15

Figs. (2 and (3) The above patters represent a case of sech fingers following severe burns of the hand from righthic gas. Operation performed was that described in the other case. The hitle finger difformity is due to the fact that the onefinal hum entirely destroyed the norm, and how analysis resulted.

to the edge of the eccative. The angles of the flaps thus made are desected back for a short distance as shown in Fig. 1 (1). So the head is extended, traction is made on the shin at the ed and a condition as shown in Fig. 1 (2) results with further traction a conduitor as shown in Fig. 1 (1) is distanced. The margins of the flaps made by the longitudinal cut slobe upon a shown in Fig. 1 (1) is distanced. The margins of the flaps made by the textion of the flaps are blared as may be necessary to permit complete extension. The flaps are blared as may be necessary to permit complete extension. The flaps are blared usine, as it may be, are frought together and sutured as shown in Fig. 1 (2). This may not be possible as shown in Fig. 1 (2). This may not be possible as shown in Fig. 1 (2). This may not be possible

near the ends, but in the center it is usually not difficult. The advantages channel for this

method of operation are

(1) That the central part of the tissueoperated upon is always covered with normal
skin, or leaded centricral tissue, and that repair
takes place in the center without further con-

traction of the original sear (2) That when sufficient skin cannot be secured to cover the entire surface of the wound caused by the operation, the uncovered portions are at the ends of the scar, or at points where there is little danger of creatricial bands reforming to moduce the original disformati



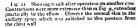




Fig. 14. Z plastic operation of the neck for hum scart, taken setth day after operation, before removal of stricts. Observe herlikhy skin in the upper flap interposed through the center of the original hum star which destroys the continuity of scar, thus avoiding any possible mento class ulter contraction.

THE WHITEHEAD OPERATION FOR HÆMORRHOIDS

A REPORT OF 200 CASES

By LLOYD NOLAND, M. D., CRISTOBAL, CAVAL ZOVE Chief of Surgical Class. Colon Borpital

In attempting to determine the safest and best method of operating for the relief of unternal hamorrhoids, the average surgeon finds the method of the safest of the safest differing opinions as to the best method of per forming this comparatively simple operation In 1882, 2gain in 1883,1 Whitehead presented

an operation which seems ideal in the light of modern surgery, affording, as it does, a means for complete removal of the discased area with absolute preservation of the function of the parts, immediate closure of the operative wound, and

permanency of cure

The writer's excuse for presenting this operation in rather minute detail is his firm beliefafter an extended use of other methods-in its superiority for the radical cure of those cases which show an almost complete circle of broadbased piles extending well above the sphincter, as well as the less marked cases involving a large part of the circumference of the rectum and also the fact that the operation scems to have fallen into disuse in the United States This is believed to be largely due to a misconception of the technique involved, and to imaginary dangers which are not borne out by actual experience. With the exception of one article recently published.3 I have been unable to find in the literature at my command any detailed description of the technique as presented in this article

The principal objections rused to this operative method have been. (1) hemorrhage during operation, (2) impairment of function, such as invontinence, stricture, etc., and (3) difficulty of

the operation and the time required

The results published in this paper are based on 200 consecutive cases operated on at Colon Hospital by the writer and his assistants, and covering a period of six years (January, 1905, to January, 1912). Nothing original is claimed for the techinque, which though different in some respects from that of Whitehead, is in many respects from that of Whitehead, is in many respects similar that of Whitehead, is a many respect similar that of Bloodgood and McGlaman. The cases were classified as follows: white male, 100, white female, 32, black male, 41, black female, 17. The olders patient operated

Whitehead Brit Med J. 1887 s pp 148 s50 s Hhitehead Brit Med J. 1887 s pp 440-455

on was 69, and the youngest 17. There were no fatalities There was no case of serious hæmorrhage, nor were symptoms referable to loss of blood at any time observed Two cases developed constriction at the anal orifice subsequent to operation Both, I believe, were due to faulty performance of the operation, and both were entirely relieved by multiple incisions of the constricting scar with dilatation One case resulted in partial incontinence, extending over a neriod of three months, with gradual improvement and complete restoration of function at the end of that period. No case of recurrence has come under observation, though a large majority of the cases have been seen frequently was no case of secondary harmorrhage or infection Seventeen cases with history of previous operation by other methods are included in this series While these cases were slightly more difficult to operate than primary cases, all made good recoveries, with apparently complete cure Comparatively speaking, the operation can be rapidly performed, no case in our series extending over 30 minutes, the average being under 25 minutes, While there is more loss of blood than with the ligature or clamp operations, there was never sufficient loss to be at all alarming, or to have any appreciable effect on the patient Post-operative retention of unne has not been a serious factor. many patients voiding without difficulty and most of the others requiring only one catheterization No case in the series required more than four catheterizations Post-operative pain is shight and easily controlled

PREPARATION OF THE PATIENT

No food is given for at least twelve hours previous to operation Castor oil, 1½ ounces, is administered eight hours previous to operation An enema is not employed if free evacuation of the bowels follows the castor oil

Eiher as the anasythetic of choice, and was employed in 174 of the cases in this series Stox aime spanal anasythesia (5 gg), fourth lumbar mijection, was employed in 26 cases, in which, for various reasons, ether seemed contraindented to No ill effects were observed following the use of stoxaine, and the anasythesia and relavation of the sphincter obstanced were highly satisfactory.

McGlangan Old Dominion J M & 5 June, 1989





With the patient in the lithotomy position, and the lithicked drain well blown next the field of the lable, the external field is carefully shived and scrubbled, and the sphinter oblight of the truth a noncal dilator of the kelly type of headed into the thins, until full dilatation is obtained. The return is then thoroughly flushed out with warm water. A sphinterioscopie is then ansated, and through it a gause sponge deposited well up in the return. The external field and the lower rectum are gone over with 60 per cent alcohol and is 5000 ordrivate valuation.

Dig a

THE BEFRACION

With the sphincter fully dilated and the hamourthoidal masses in view, I clamps are care fully placed around the entire circumference of the lawel at the nucocutaneous junction (Fig. () Care must be taken to grasp and the larest With the left forefinger in the edge of skin rectum, as a gunde, an incision is then made through the skin around the entire circle, keeping closely against the upper edge of the clamps When this preliminary incision has been completed, traction is mole on the clamps and with free strokes of the scalpal the sphincter is experted (Fig 2) If the foreinger is used as a guide and care be taken that the strokes of the scalpel are made at right angles to the guiding finger and close to the retracting skin margin, a very rapid exposure of the entire circumference of the sphincter can be obtained, with little or no harmorrhage or tearing of the tissues The lowest attachment of the muscle to the bowel is then freed with a few strokes of the scalpel and the muscle rapidly rolled back, using the side of the scalpel blade or hamile, until the hymorrhoidal area is passed. The clamps should now be reset,

close together, around the entire circle, gra-prog normal tresse rust along the hamorrhoidal area Care should be taken that the dissection has been sufficiently complete to allow that portion of the bawel at the unper edge of the reset clamps to be brought to the skin margin free of any tension, and that my partion of the muscle is in the grain of the clamp. The whole field is then florded with bit normal value solution until all cozing has ceased. An incision is now made in the long axis of the bowel (fig. 4) extending to just above the line of the clamps, and the first suture is taken from skin through roucous membrare at its aper. The line of sutures is continued around the execumference of the any, by cutting along the clamp line a small section at a time, (112 a) each section being carefully sutured at cut The operation is completed with the removal of the rectal sponge, thishing off the sature line with normal caline solution, and the insertion of a gruze wrapped rubber tube, about 1/2 inch in diameter, thickly coated with indoform outment No tension sutures are employed, the necessity for these being overcome by a physicition extending high enough to make an easy approximation of the parts, absolutely free of tension Ligation of bleeding vessels is rarely, if ever, necessary The only bleeding of importance usually encountered is from the vessels in the walls of the rectum proper. By putting a slight lateral tension on each small section as cut, and introducing the sutures at a very slight angle to the lone axis of the bowel, the bleeching in these vessels is easily controlled by the sutures alone sutures are employed, the number varying from 18 to 30. Any fine non-ab-orbable suture material can be used. We have found Pagenstecher yarn by far the most satisfactory.



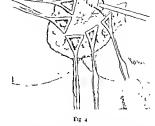


Fig 3

An accurate approximation of gut to skin is essential to the success of the operation, and special care should be taken that there is no puckering of skin or bowel in any way decreasing the size of the anal outlet. Ordinarily, good surgical technique—a careful dissection careful sufficiently high to allow normal gut to be brought to the skin line without tension, the use of many interrupted sutures, with careful approximation of the tissue, bearing in mind always the fact that the anal orifice should easily admit two fingers without tension on the suture line—will believe, give uniformly good results with no fear of stricture, harmorrhage or infection

POST-OPERATIVE TREATMENT

The rectal tube is removed in 24 hours Iodoform ointment is applied two or three times a day for three days. On the fourth day a dose of castor oil sufficiently large to obtain a free evacuation is given. The operative field is slushed off after each defeaction, up to the fifth day. The sutures are allowed to separate and come away without unterference. This is usually accomplished within ten to twelve days. The patient is allowed to leave his bed on the fourth day and can usually be discharged from hospital by the seventh day.

I wish to express my thanks to Colonel W. C. Gorgas, Chief Sanitary Officer, Isthmian Canal Commission, for permission to publish this paper, and to Surgeon Wm. H. Bell, United States Navy, and Superintendent of Colon Hospital, for his kindness in preparing the accompanying drawines.

THE CURE OF PROCIDENTIA UTERI IN ELDERLY WOMEN

A NEW INTRA-ABDOMINAL TECHNIQUE

By FRED FLETCHER, M D COLUMBIS, Office Surgeon to Grant Hospital

TMIC discussion accorded uterwaginal prolapse at the last meeting of the Amencan Medical Association (1), convinces one that there has been no general agreement among surgeons as to the best method of operating Practically roo per cent of the cases operated upon by amateur surgeons recur, and patients who have been operated upon according to certain recognized principles by competent men, not infrequently return complaining of discomfort from eystocie.

The Kocher (6) Crile (7) Eastman (8) and Mayo (9) are recognized abdominal operations for

the eure of procidentia.

216

The Warkins-Wertheim, Goffe (2), Hirst (3), and Duiley methods are cited as the most statisfactory raginal operations. The Wertheim technique supports the bladder by interposing the uncertainty of the properties of the desired of the peritoneum opened, and the fundus of the uterus pulled forward between the bladder and vagins and sutured. The operation is completed by amputating the cervivand repairing the posterior vaginal wall. The technique is not

difficult, and the dangers of injuring the bladder are minimized if the surgeon bears in mind that the blue veins, easily seen in making the gauze dissection, rest immediately upon the bladder. The Wertheim procedure has the advantage of conservation, and meets the requirement of those who argue that an abdominal incision adds an unnecessary element of risk to a class of

patients normally obesc.

Baldy, of Phafadelphia, in a recent article (a), described a new technique for the cure of procidentia. The intra-abdominal features of his operation (except the cera leal fastion) have for
years been practiced as a routine at the Grant
Hospital in the making of supravaginal hysteriones. Personally, I have used the procedure
described by Blady, and discarded it only when
convinced that the operation to be detailed fater
gave better cent results. The point made vilage
set better cent results. The point made vilage
to the public bone is the important feature of the
Baldy technique, and obtains in the operation
which I practice.

The following procedures have been used by me for the past four years, and the results which





Fig 1

Fig 2

I have obtained in a considerable number of There are certain cases justify this report. features of the intra-abdominal work which, to my knowledge, have not been recorded

The operation is essentially an abdominal hysterectomy, the uterus being amputated at the internal os, and the stumps of the broad figaments, together with the round ligaments, being utilized (according to the Gilliam principles of suspension) as a secure means of supporting the cervix stump and bladder close to the pubic bone. The abdominal operation is preceded by the following plastic operations on cervix and vagina:

Amputation of cervix The usual high amputation is made, thoroughly removing the mucous membrane from the cervical canal, and closing the stump with four deep sutures of No. 3 chromic gut.

Anterior colborrhably An oval denudation is made, extending to within one half inch of the urethral orifice, over the most prominent part of the cystocele It is important to conserve the fascial layers, stripping them by gauze dissection from the vaginal membrane. The bladder is thoroughly freed and the defect closed with a purse-string suture of No 3 chromic gut

Perineorrhaphy The relaxed posterior vaginal wall is resected in a rectangular manner, widely exposing the rectocele and retracted levator ani muscles in the lateral sulci. The defect is closed by means of a Waldo figure-of-eight stitch, using No. 4 chromic gut (5). Before tying the stitch, a suture is passed through the levator ani muscles so that when tied they form a bridge across the rectocele and push it back in hourglass fashion The Waldo stitch is tied by pulling in a seesaw manner.

ABDOMINAL TECHNIQUE

The abdomen is opened through a short suprapubic incision which splits the inner border of the right rectus muscle. A supravaginal hysterectomy is made, severing the broad ligaments flush with the uterus, and dividing the cervix at the internal of The cervical canal is touched with iodine. The ovarian and uterme arteries are ligated. The tubes and ovaries are removed with the least possible destruction of the broad ligaments. It is a curious fact that the procidentia cases are usually clean, the body of the uterus being small, the tubes and ovaries normal in appearance and the ligaments relaxed The heavy part of the uterus is the vaginal segment.

The fat on either side of the incision is freed from the abdominal aponeurosis, and a one-halfinch cut is made through the aponeurosis at the outer border of the rectus muscle A pointed

hæmostat is introduced through this cut in such a manner as to separate the muscle fibers and bulge the peritoneum, the latter being opened with a pair of curved scissors. The stump of the broad ligament is now grasped with the hamostat and pulled through the opening made in the abdominal wall, exactly as in the Gilliam method

of suspension for retroversion. When the broad figament stumps have been delivered through the abdominal wall they are drawn taut so as to pull the cervix stump in the lower angle of the incision immediately above the pubic bone Fixation of the cervix stump is comparatively easy. A curved needle (carrying No 1 chromic gut) catches the muscle and peritoneum, to the side, at the lower angle of the abdominal incision, passes through the posterior layer of the broad ligament, then through the side of the cervix stump, and out through the anterior leaf of the broad ligament, returning to the starting place. The suture is not tied until the same procedure is practiced on the opposite side The tying of these sutures fixes the raw surface of the cervix stump to the peritoneum and approximates the two layers of the broad ligaments, which are always separated at the point where the uterus is amoutated (Fig. 1).

The abdominal wall is closed in the usual layer fashion, using No 2 chromic gut for the aponeu-The broad ligament stumps and the redundant round ligament form broad serous flaps which are overlapped and sutured above the aponeurosis in the manner shown in Fig. 2.

Aside from the henefit which results from plastic work in the vagina, the intra-abdominal procedure accomplishes what Baldy points out for his technique (4), namely, (1) The weight of the heavy uterus is removed, (2) the overstretched vagina is lifted high and held firmly in place, (3) the supports utilized are natural supports of the uterus and vagina-the broad ligaments, (4) the cervix remains a pelvic organ. as is natural, and (5) the immediate and remote results, as regards fixation of the upper part of the vagina, are perfect

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HOW TO SECURE THE END OF A SUBCUTICULAR SUTURE

By FRANCIS REDER, M. D. St. Locis

THE subcuticular suture as given to us by Halsted is a splendid suture. In certain neck, it is not only admirably adapted, but it is the suture of choice.

When properly applied it leaves a scar that in the course of several months becomes almost invisible. The suture has not found the favor with surgeons that it should. Why? It is true its method of application requires some special practice. In surgical work that is not at all The polish of a finished surgeon is the result of work that comes after years of close application. It is immaterial whether or not the surgeon uses a large straight needle or a small curved needle (that is a fancy which rests with his definess) in penetrating the proper stratum of the skin that a classic wound closure may be obtained. it is material with him, however, how to best se cure the end of the suture after has ing united the skin margins

In my observations of the work of different surgeons working with the subcuticular squire, this very point seems to be a stumbling-block. It appears to me that here lies, to a great extent, the cause for the limited usage of this efficient

Some surgeons, after having finished the subcutrediar stifts, secure the end by simply poering the skin with the needle armed with the catgut the or three times a short distance away from the angle of the wound, in that way anchoring the surure end. Others pierce the skin near the angle of the wound and the a knot by looping one side of the suture. Such a procedure is not in accord with the idea of a subcuttcular suture. It deleast its object and mars its beauty. There is no necessity for it and the scarring it causes, mild as it may be, is uncalled for

I have for a number of years, whenever the subcuttcular suture was employed, secured the

end in this manner

The suture is started by having the end of the catgut strand well knotted so as to form a good point of resistance to the skin The skin margins are brought and held in apposition by the stitch best suited to the operator's skall

When the opposite angle is reached, in order to secure the suture, the needle is passed under the skin in line with the axis of the closed wound and



the catgut strand pulled through the skin about one-fourth of an tuch from the angle of the wound. The protruding end should be two to three inches long at least. A separate piece of the same catgut strand about four inches long (long enough to be conveniently handled) is tied about its middle to the protruding strand "A" at its base 'D A simple and single knot is all that is necessary. We will designate, for the sake of a clearer understanding, the end, of this strand B" and C' Next strands "A," "B" and "C" are tied together at "D" in a firm knot, large enough to offer the proper skin resistance. This knot will be effective in securing the suture without any additional trauma to the skin

The strands "A" "B" and "C" are cut short. It may be stated that the correct application of a subcuticular suture can be very satisfactorily executed with numbers o, 1, or 2 plann strelle catgut Good flewhility and pliability of the catgut is a qualification which is of considerable technical importance.

For the past four months we have stored the gut in McDonald's action-alcohol-gly ceine solution (Am J Surg, May, 1910), with results supernor to those obtained when stored in plain alcohol. This solution renders the gut smoother and stronger without decreasing its elasticity and plaability.

OBSTETRICAL AND SURGICAL TREATMENT OF PUERPERAL ECLAMPSIA'

By JOHN F MORAN, M D, WASHINGTON, D C

ECLANPSIA is the gravest complication in obstetrics, grave because of its unknown etiology, grave because of its known pathology, showing the presence of a highly irritating torin in the circulation, and grave because of its often sad result, the loss of both mother and child

otner and cuito

Upon whatever theoretic basis we may predicate the etiology of eclampsia, whether of feetal, maternal, or combined origin, the one incontrovertible fact is that pregnancy at least is necessary, for without pregnancy there can be no eclampsia Therefore, the therapeutic conclusion must be that in eclampsia prompt termi nation of the pregnancy, through the quickest possible delivery consistent with safety, is of primary importance. It is quite possible that the eclamptic may withstand the attacks without immediate delivery, and the birth may terminate safely It is nevertheless true that many women succumb who are left to expel the child unassisted Therefore the prognosis is much more favorable in a prompt delivery than in one that has been delayed

How the termination of the pregnancy shall be effected must be governed by the condition of the cervix, frequency of the convulsions, and depth of the coma If the cervix is already dilated and there is no longer any contraindication to the use of forceps or version, rapid delivery is easily accomplished Such cases occurring late in the stage of dilation have, as is well known, a relatively fas orable prognosis It is less promising when the convulsions appear before the cervix is sufficiently dilated. If the cervix is effaced but the external os remains undilated, metal or manual dilatation may suffice to effect quick delivery If time is not a necessary factor, in multiparæ with old lacerations of the cervix. instrumental or manual dilatation might be hazardous, therefore in these cases rubber bags can be employed The author recalls one such case in which an old tear of the cervix being felt to give way during manual dilatation, the method was promptly abandoned and a Voorhees bag substituted with success.

When the cervical canal is rigid and not unfolded, metal and manual dilatation, or, more correctly speaking, duulsion, of the cervix

aggravates the celamptic seizures and causes shock, deep cervical tears are not inferquent, and hemorrhage and infection often complicate the situation Therefore, we have in cases of intact cervices with menacing signs the operations of vaginal hysterotomy and abdominal Causarean section at our command The former is indicated in cases occurring before the eighth month and

the latter after that time.

Like many other innovations, vaginal Casarean
section has been vehemently opposed as being an
ratanonal and hazardous procedure, and even
stigmatized as the prostituition of surgery, yet,
in spate of the opposition, it is teadely growing in
favor and is considered by many as the most
unportant addution to obstetric technique in

modern times

Peterson 2 has collected 530 cases of eclampsia in which vaginal Cæsarean section was performed, with 124 deaths, or a mortality of 23 per cent In this connection it might be stated that general statistics are not always infallible as to the merits of a measure in any particular case, depending as they do upon the environment, and the judgment and skill of many operators Rather should we judge the measure and its possibilities from the results obtained by individual operators For instance, in 33 cases of vaginal Cæsarean section for eclampsia. Veite had only one death, and Bumm had only one death in 40 consecutive cases The operation has been performed 26 times in this city, by 5 operators, with 2 deaths, or less than 8 per cent

The author recently reported four cases of classical Cassarcan section for eclampia successfully operated upon four or more times in this city; three times in one case by Dr. W. P. Cart and one case by Dr. W. P. Cart and one case by Dr. Stone. All the children were delivered alive and three are still living. In reviewing the literature the author collected 116 cases, with a maternal mortality of 48 93 per cent and infant mortality of 39 per cent. At first glance this is not a convincing argument in favor of this method of intervention in eclampia, but the final analysis shows that a very large percentage of the patients had been previously subjected to other methods of treatment, and many were practically

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Read in a Symposium on Eclampus before the Medical Society of Georgetown University, November 9, 2012

moribund fefore the operation was re-orted to. If we compare the series of \$2 cases from 1901, collected by myself, with the previous ones, we find that the death rate for the mothers has been reduced to \$3.32 per cent and for the infant, 19 per cent. This steady improvement in the statistics has been due in a great measure to better technique, greater care in the selection of the cases, and prompt intervention.

Certainly with the knowledge gained and with wider experience, it is reasonable to expect that the mortality will, in appropriate cases, by the elective classical and vaginal Cassarean section

be still further reduced

Lumbar nareous has been practiced in eclampsia, but without success, likewise lumbar puncture, with subsequent a-pirating of the cerebrospinal fluid

Zangmeister 1 believes that eclampsia is a kind of reflex epilepsy and is the result of pressure from redema of the brain, which is enormously increased during the strain of each labor pain and which he claims may be reheved by reducing the pressure through the agency of prompt treplining Langmeister had the courage of his convictions, and actually the the operation to three severe cases of eclampsia persisting after delivery, two of which patients recovered and the third died on the sixth day, although the eclampua had long subsided. In the litter case the dura had been sutured again after the operation, and it is possible that the ordems recurred Kosmak says this must be regarded as rather an extreme form of treatment, and may be classed with that which depends on a complete amoutation of the breasts for the subsidence of the consulsions

As to whether I dicholl's operation of designalatin of the kinleys, will extend its sphere of uvefulness to exlampisa, it is not possible to form any definite conclusions from the available data. Of the ten cases on record, the decapulation was followed by rappit recovery of six of the patients, in two cases no benefit was manifest, and in the renalizing two improvement was probable, but not pronounced. In eight cases the women had been delivered before the operation, including once of the control of the control of the control of the operation. In the other cases the operation had been done before the execution of the uterus, the results being successful in only one of these

Venesection is so seldom practiced nowadays in the treatment of eclampsia as to be almost regarded as a lost art, and yet in suitable cases

Outed from Kosmak, Am J Obst. & Docuses Stomes & Children 1913 law 5

it is one of the most valuable measures at our command in combating eclampia. Where the blood pressure is high, with eyanosis, rapidly recurring convulsions, deepening coma, and threatened ordema of the lungs, it is particularly serviceable. Its beneficent effect was strikingly shown, where those inducations were present, in a post-partial case seen recently in consultation with Dr. Wilson, and the author is throughly convanced that the blood letting was the principal

means of saving the patient The author wishes to say a word of caution regarding anasthesia Chloroform, almost since its discovery, has been considered as one of the sheet anchor remedies in eelampsia. An unfortunate experience in the loss of a case from late chloroform poisoning has taught me that it is an exceedingly dangerous remedy and that its value has been greatly overrated. Recent investigations have demonstrated that it produces lesions of the liver and other organs similar to those of eclampsia. Given at the time of the convulsion. when there is a tendency to asphysiation, it increases the difficulty by interfering with the supply of oxygen, and, furthermore, it is a cardiac depresent The author has for these reasons abandoned its use in obstetrical cases, and restricts the administration of the anasthetic until the time of intervention, and gives ether

Dr. Foote informs me that the two fatal local ares after vaginal Cestrean section had received introus oxide amesthesia. Since that time investigation by himself and Hamilton shows that the animonia coefficient is increased in some cases with resulting acidosis, so, like chloroform, its use in echimical section.

Of course, synchronously with the obstetrical or surgical termination of the pregnancy, climinants and sedatives are to be employed, because the combined treatment yields the best results

It must be borne in mind that we have as yet no specific treatment for eclampsia, and the method of intervention must be adapted to the exigencies of the individual ease. In the presence of the severe types we are well night hopeless. The graver forms comprise from 3 to 5 per cent of the cases in general, they are more frequent at different periods, and they may appear in groups Such was our experience at Columbia Hospital After having obtained for several years quite successful results, that is in say with a mortality of to to 15 per cent, these were followed by a series of cases in which the previously approved treatment absolutely failed, the mortality reaching 70 per cent These malignant cases are frequently attended with few convulsions, come quickly

supervening after the first seizure, accompanied by fever, jaundice, hæmaglobinuria, or suppression of urine, and they are rapidly fatal.

In conclusion, while the etiology of eclampsia is still unsolved, its clinical phenomena and pathology point to a probable intoxication of foetal, maternal, or combined origin. Therefore, evacuation of the uterus, elimination, and sedation are the chief indications in the treatment. The sedatives are valuable for their tranquillizing influence while delivery is being promoted or effected by other direct measures The result in a given case will depend upon the severity of the attack, the judgment and skill of the physician, and the rigid observance of asepsis Essential to success is a well-thought-out plan of prompt but not overzealous procedure, based upon the various phases of the disease, combined with a knowledge of the condition of the certix and the changes it must undergo before pregnancy can terminate or be terminated.

The author wishes to supplement this conclu-

slon with the following "Don'ts".

Don't delay terminating the pregnancy after the onset of the first convulsion The earlier the uterus is evacuated, the lower the maternal and fortal mortality.

Don't treat the patient haphazardly, as the

mortality and morbidity are exceedingly high under such conditions. Endeavor to choose the right method of operation in the first instance.

Don't give chloroform or nitrous oxide, as they both cause acidosis Ether, while not free from objection, is the least harmful, but its administration should be restricted to the time of interven-

Don't forcibly dilate an intact or rigid cervix. It is irrational and unjustifiable. Bear in mind the physiological and anatomical changes necessary to soften and unfold the cervix, and dilate the external os The divulsion of the cervix in a few minutes by instrumental or manual methods - what Nature takes, under normal conditions, hours to do to preserve the integrity of the soft parts - is unscientific, dangerous, and brutal, It is in this class of cases that the cutting operations, when done primarily, give such excellent results Vagunal hysterotomy is the operation of election up to the eighth month, and the abdominal Cæsarean section after that time, particularly when the child is of average size or has a weak foetal heart beat, in cases of corpulency

or when the cervix is high, in posterior positions

If these "don'ts" be universally observed we
will see a great reduction in the mortality and

morbidity of eclampsia

DILATATION OF TIGHT URETHRAL STRICTURES CAUSING RETENTION

BY W. S SCHLEY, M D, NEW YORK CITY

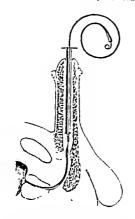
CCASIONALLY, even with the aid of the endoscope it is impossible to pass a fillorm through a ught urethral structure which is causing retention, or, if not impossible, at least it is accomplished only after the expenditure of considerable time and lahor and with the danger of urethral laceration. The injection of oil and the west of excities and adversalm in the urethra are of great service, but they must come in threet con tact with the structured area.

The following method I employed for the first time nearly seerity years ago, and with its aid some of the difficult strictures of the uterthra may be passed and subsequently distred without urethrotomy, external or internal. It has served extremely well in those strictures far enough forward to be instrumented with accuracy from the meatus.

An endoscope is passed to the site of the

stricture, developing its orfice. A blunt pointed found end needle of hypodermic type and 17 or 18 Brown & Sharpe gauge diameter is pressed against or as a far in the ordinaries of the extremely gentle pressure will allow, and a few drops of coane-adrenalm mixture intended in a few manutes it is usually possible to insert the needle very appreciably farther intended to the needle very appreciably farther intended and injections made through this, advancing steff and injections made through this, advancing stefficiently flevible, especially the tip, and takes the irregularities in the stricture well. Ten or fifteen drops of the solution are usually sufficient. The case helow is flugstrative.

E. R., April 28, 1906. A man of 50 years of age had had a stricture of the urethra for over 13 years. He presented himself, with complete retention, having been unable to



void utine since forcing out a few drops to the early morn ing some hours before I thforms failed to pass endoscope showed a tight stricture beginning just below the penoscrotal junction. By moderate pressure on the instrument the orifice was developed more clearly as the mucosa was stretched from the center, but it was unpossible to more than barely enter a fillorm. A long medium and blunt end needle entered 2 or 3 mm and a few drops of equal parts 1-1000 adrenalin and 4 per cent cocaine solution were injected. After the needle had passed about 5 mm the ureteral catheter was used, and in a total of fifteen minutes' work it had passed to the bladder The stricture proved to be of a cm length The following day it was more difficult to insert the catheter, and I regretted not having left a fillform in place. There was undoubtedly engorgement following the amemia produced and the mechanical insult. On the third day, however, it was possible to pass a No & I elastic hougie and a week later a No 10 F from that time on the dil-tation was simple. Three months later a No 25 I sound passed smoothly



After the first dilatation it is well to leave a filtorm in the urethra directionomy is not done. The latter operation may be done with the Massounceuv or any of its modifications with or without an external urethrotomy if preferred, or an external urethrotomy on with the filiform as a guide, or the structure reserved for dilatation later.

It is not the intention of this paper to go into the relative merits of dilatation or urethrotomy for these cases or retrograle passage of structure, penneal or suprapubic, but to suggest a method of passing some of the difficult ones for the relief of retention or for a guide for urethrotomy

TRANSACTIONS OF SOCIETIES

CHICAGO SURGICAL SOCIETY

REGULAR MEETING HELD NOVEMBER 3, 1911, THE PRESIDENT, DR. FREDERIC A BESLEY, IN THE CHAIR

Dr. E. C Riebel read a paper entitled, "Rupture of the Diaphragm, and Positive Pressure (Meltzer's Insufflation) " See p 133.

DISCUSSION

DR H M RICHTER: Dr. Riebel, in his paper, opens up a number of phases of thoracic surgery for discussion. First, what class of cases require the use of a device for maintaining respiration, second, what apparatus should be used, and, third, which of the various types of artificial

respiration should be used.

First, as to what cases require the artificial methods of maintaining respiration in thoracic surgery? For our purpose, we may consider the chest made up of two compartments, separated by a complete diaphragm, and each section capable of functionating independently of the other, either one functionating without the other and capable of maintaining life Therefore, if the injury or the disease is such that one side of the chest only is interfered with, it would seem to me we immediately do away with all need of any type of artificial respiration. For instance, we may safely open one side of the chest for any purpose whatever, opening it through the diaphragm or through the chest wall would, of course, be equivalent. A runture of the diaphragm, resulting in a hollow viscus of the abdomen passing up into the chest cavity, may be handled either by increasing the intrathoracic tension by any positive pressure device in use, or, more simply, by making an incision between two ribs and allowing air to enter the chest in that way. If in such a case of rupture of the diaphragm on one side the incision were made between two ribs, it would be difficult to maintain the abdominal viscera in the chest. They tend to slide back into the abdomen in the same way as in ordinary laparotomies. An incision made through the abdominal wall in a patient who is completely relaxed would not tend to allow the hollow viscera to escape through the abdominal incision. With

the patient relaxed the viscera would remain

within the abdomen.

Taking it for granted that we have occasion to use some method of artificial respiration and of maintaining life by it, then there are three types of apparatus to be considered in making our choice, the type of so called negative pressure apparatus devised by Sauerbruck, the various positive pressure types of apparatus, all of which work practically on the same principle, and thirdly, the method of Meltzer If life can be maintained by getting air within the lung without making any respiratory movements, if the external respiratory movements are not essential to life, if their only object is to get air within the lungs, then it seems to me, the Meltzer apparatus is the ideal apparatus, because by passing a tube down the trachea to near the bifurcation and passing a continuous current of air through it we can obtain air in the lung where we want it. As a matter of fact, that has been done.

I saw some of Dr Riebel's work, and I have personally used Meltzer's method, and there is no doubt at all but what it is a successful method. The so-called positive and negative pressure methods of maintaining artificial respiration are based upon the same mechanical principle, the positive pressure devices are simpler, Meltzer's method should displace both to a great extent

The device of which I published a description a counle of years ago was a comparatively simple one for maintaining the lungs in distention and maintaining artificial respiration, but the Meltzer device has rendered it to a great extent unnecessary If we need some method of maintaining respiration and of getting air into the lungs, the Meltzer method would appear to be the method to use.

Dr Riebel spoke of using from forty to sixty millimeters of mercury with the Meltzer apparatus, and I think he meant with the chest opened. The tension within the lungs may be raised to a

great height, provided the chest is closed. A man in playing such an instrument as a horn can raise the tension within his chest to a considerable height. A man descending heneath the surface of the water raises the tension fifteen pounds for every thirty-two feet he descends. But the lungs will not stand a tension of more than ten or fifteen millumeters of mercury with the chest opened, because the lungs are so delicate that with that amount of tension, without protection of the chest wall, they would balloon up indefinitely. A pressure of six or eight millimeters within the lung with the chest opened will maintain the lungs in the ordinary sized dog at the normal physiological extent of distention. A pressure of ten to twelve millimeters of mercury will blow the lungs out of the chest. We are making an error in our deductions from experimental work on dogs, in that we are forgetting that the dog's chest for experimental purposes is practically a single cavity instead of a double cavity. The doe's mediastinal septum is so thin and movable that, if we open one side of the chest wall, it practically allows collapse of both lungs That does not apply to human heings, except to young infants

DR ARTHUR DEAN BEVAN: Dr Richter's discussion is a very able one and particularly valuable, because he has done a good deal of work along this line, and I think the conclusions he has arrived at are absolutely correct. You all know that a lot of money has been spent in connection with this work. For example, one New York surgeon has had a special operating room constructed at the expense of many thousands of dollars, and then when Meltzer introduced his simple apparatus, this surgeon naturally criticised the simple Meltzer apparatus because he had already spent some twenty-five thousand dollars for installing an elaborate apparatus which meant that amount of money thrown away if Meltzer's apparatus was as efficient has been a whole lot of work done along this line But just as Dr Richter has pointed out, one lung will work and carry on the function of the body just as one kidney will do. That point has been shown by a lot of very good work

Dr. John Young Brown, of St Louis, read a paper before the Illimos State Medical Society a few years ago, in which he reported some twelve or fourteen cases of rupture of the diaphragm, where he opened the chest wall and repaired the rupture through the transthoracie route, showing definitely that this work could be done without danger. He only lost two of his cases. He showed that this work can be done very well without any elaborate apparatus.

Dr. Wm J. Mayo often does his kidney work by resecting the twelfth rib. He has told me several times that in a number of cases he has opened the pleural cavity in resecting the twelfth rib in his kidney work, although he has never had any trouble whatever. He has made immediate closure. Personally, I have had a number of experiences of opening the pleura. I have always had the fear of doing it and of making artificial pneumothorax I have done that a number of times, but with no serious trouble unless infection follows. I am thoroughly convinced we can take the position which Dr. Richter has so well laid down, that if one lung is normal, and you are operating on the other lung, you do not need all these complicated apparatuses, that you can go ahead and operate under proper anasthesia, and if you do not get infection, you can do a great deal of work on that side without any trouble Take the work that Dr John R. McDilli has done of transthoracic opening of liver abscesses. This is a very good scheme In the McDill scheme of exposing the upper surface of the liver by the transthoracic route, he takes particular care to try and avoid opening the pleural cavity, but you may be sure that he sometimes has a collapsed lung. Suppose he wants to attack the subphrenic space or upper surface of the liver; he will make a concave incision, resecting one or two ribs subperiosteally; then he will have his assistant hold his fingers on the flaccid chest wall from which the ribs have been removed, and push the flaccid wall against the diaphragm, then he cuts through the chest wall and cuts through the diaphragm, then he will sew up the chest wall and diaphragm together, whip them up with a continuous suture or whipping suture so as to hold the chest wall and diaphragm together and close the pleural cavity so that you can open the subphrenic or abscess of the liver or do any operation in that way. You may be sure, in the hundred or more cases that John McDill has operated upon in that way, in many of them he has had collapse of the lung. He had immediate closure of the pleural cavity with a given suture line, and, as a rule, no resulting infection Of course, occasionally there is an injection; I should not hesitate at all in a case of rupture of the diaphragm to-day, where the individual had any trouble with the other lung, to attack the lesson through the transthoracic route without any special form of pressure apparatus, and with a good anæsthetic sew at up just as I would an ordinary bernia, and then make a clean closure of the thoracic wound,

MicDill, John E Sutg , Gynec, & Obst 1911, 24, 523

with the expectation that the air in the chest would be taken care of within a short time and the interference with the lung function would be of little moment in the case, provided I had

succeeded in excluding any infection. DR. E. WYLLYS ANDREWS: This paper and the discussion on it have taken a direction in which I have made something of a hobby of late years, since not long ago I had five cases of operative treatment of wounds of the diaphragm in one year One point which has been emphasized is that opening the pleural cavity may be a perfectly harmless thing The other is the necessity of treating these disphragm lesions through the chest and not through the peritoneum. We used to hear from Willard's experiments and those of others of rushing cool air into the pleura, producing shock and collapse and dyspnoxa It does not do anything of the kind. I have done it accidentally, and have been foolishly terrified by the hissing sound of a little air entering when resecting a tuberculous rib, or operating upon a kidney, or in trying to reach an abscess of the liver Having found that we were unnecessarily alarmed over this, we have gone a little farther and let air in deliberately with no bad result Within a year I have freely incised the chest, taken out four or five ribs, and removed a carcinoma of the mamma We used to think this almost as dangerous as letting air into the jugular vein. Opening the pleural cavity does not only not endanger life, but I have seen with my own eyes several instances in which the lung did not collapse at all I believe the lung can he exposed against a large leston of the side of the chest and remain perfectly expanded and continue to expand with all the suction pressure of the chest and disphragm removed, or at least, the suction pressure of the chest

I had a case, about a year ago, in which the diaphragm was ruptured by internal pressure from a traumatic heroia, the colon being pushed up through it, and, at the same time, the rihs were detached, four in number, from the sternum in front. I tried to reduce the colon and suture the wound and the diaphragm through the chest, but during that operation and the time required to make the replacement, the lung was actively expanding and pushing itself out into the open area just as if it were being blown up with a positive bellows I cannot understand that, but I saw it. Of course, we would infer the reason of the lung expanding is suction of the chest wall by the vacuum about the lung, just as if it were tightly agglutinated to the ribs and diaphragm But in at least two instances, and I think in others, I

have seen the lung in the wounded chest with a comparatively large hole through the chest wall and skin actively expanding itself as if the chest wall were not open at all.

To repair a wound of the diaphragm, the transthoracic route is the proper one. I think it is only fair to insist on it by way of warning those whose first impulse is to attack such a lesion through the peritoneum. We are accustomed to working in this cavity, and we first think it is easy to suture the diaphragm from below. The moment you have a large experience with these cases and follow up the literature, you will find by your own experience and by the uniform testimony of others who have tried it, that it is the most difficult operation you can possibly attempt. It is most inaccessible and tedious to reach the lower surface of the diaphragm. On the other hand, if you open one side of the chest freely to expose the diaphragm, there is practically no distance from the ribs inward. It is a dome-shaped affair, scarcely half an inch away from outer chest wall at the seventh to tenth rib I will go a step further and say that we should often do a faparotomy transpleurally, say for a liver abscess or growth, or for operations on the I give a very cardial orifice of the stomach lair drawing of this technique (taken from Cranwell of Rio Janeiro) in my article in Vol VII. Bryant and Buck's Surgery Some fine plates and descriptions are also to be found in Sauerbruck's new book, "Thoraxchirurgie"

DR COLEMAN G BUFORD. After one has had considerable experience in chest work, he finds that it is not necessary to adopt complicated methods in the large majority of troubles like that in question It does not take long to ascertain how much real work can be done through the chest wall, when the lung is already collapsed. This collapse can be brought about through a simple stab wound of the thorax or by resection of the ribs with little if any resultant difficulty in breathing Each of us has seen how little disturbance in this connection has been caused. when we have been called upon to drain one side of the chest for empy ema and how much available operative space there is in the thorax. We may go still further and recall the experience of others, if not within our own experience, who have even drained both sides of the thorax for empyema with favorable outcomes. It therefore seems to me quite rational to resect the chest wall and use this as the operative field in cases where the diaphragm has been ruptured and the viscera have prolapsed into the thorax. I feel as Dr. Andrews does about it, that this is the most accessible field for repair of the diaphragm. It occurs to me this moment that there might be occasions when one would want to repair the diaphraem on one side and immediately expand the lung on that side to facilitate breathing and follow it by renair of wounds in the other thoracic cavity In this connection. I recall an experience I had a short time ago. I resected the chest walf lor secondary carcinoma Dr Bevan saw this case with me I took out parts of two ribs. In doing this I easily teased off the pleura, but while suturing the skin, the pleura was punctured and the lung collapsed. The opening immediately gaped instead of closing. The pleura was so thin I could not suture it The skin and cellular tissue were sutured tightly, thus completely closing the wound I now put a trochar in the chest wall, aspirating all of the air that I could. which permitted of immediate lung expansion to the extent that the lower posterior border was about two fingers' breadth higher than it should be On the third day the lung boundary was normal. This plan of management might be more generally practiced than it is in wounds of the thorax, permitting of immediate closure

DR L L MCARTHUR I would like to say, that possibly there is a misconception in regard to Dr Riebel's statement, that the pre-sure within the lung was raised from lorty to sixty millimeters of mercury in using the Meltzer apparatus That pressure may be shown in the manometer, but the catheter, not filling the entire trachea, permits air to escape, so manometer does not measure the actual pressure within the bronchi themselves I, too, have shown to this society a case of resection of the chest wall en bloe for carcinoma, in which I proceeded bolilly to resect an area in the chest wall involving two ribs, the perscardium being brought distinctly in view and the lung collapsed, then suturing more snugly than usual the temporarily reflected skin and superficial tissues I aspirated the chest cavity immediately of the air left there, using a protected needle (a needle that has a sharp point for penetration, but as soon as it enters the chest cavity is covered with a rounded point that prevents injury to the lungs) I immediately succeeded in expanding the lung to its lull

amount. We could feel it against the needle low down in the chest cavity. The aid which comes from increasing the pressure in the lungs, by any one of the positive pressure apparatuses, is particularly great and efficient when it comes to sature of the lung substance, or suture of the lung to the chest wall, as is sometimes desirable when the tung is later, at a second step, to be penetrated

fung is later, at a second step, to be penetrated Dz. Rieszi. (dosing): There is on fact I tried to point out, namely, that so many investigators differ in their conception of a pneumothorax. Collapse of the lung alone is not pneumothorax. That is the reason why I described my case in the human revembling an experiment; the cleast sail was held open with two retracters and there was no disturbance at all. An internal of tensor pneumothorax, on the other hand, is the segment of the segment of the control of the segment of the control of the control of the segment of the control of the

I looked over the article of Dr. Brown which Dr Bevan referred to, and, as I understood it, he dull not cite any subcutaneous ruptures Ilis cases were all instances of stab wounds with

wounds of the diaphraem.

DR BELAN: They were all traumatic

Dr Rient. They were all open wounds, but mine was a subestaneous rupture of the duphragm, and in a case like that, with marked mucrular defense, the possibility of an injury of an abdominal organ would have to be considered. I find in the literature a good many cases of stab wounds of the chest, where finally laparotomy had to be done to reduce the prolapse which was not ressible from above.

It is too late to answer all the points brough out by Dr. Richter and to go mote the difference between the value of Meltzer's positive pressure and that of Beaver, suffice it to say it so entirely different character. The positive pressure Dr. Richter has been working with is static in character, whereas Meltzer's is dynamic. Regarding prome difference of the pressure Luced was forty, and then, of course, it was that only at the manometer.

WASHINGTON SURGICAL SOCIETY

REGULAR MEETING HELD MAY 17, 1912, WITH THE PRESIDENT, DR. CARR, IN THE CHAIR

DR. FOWLER reported four cases, with specimens, of suprapuble prostatectomy, illustrating the good results of this method in selected cases having large and medium sized adenomatous prostates. There is no danger to the rectum and the ejaculatory ducts are preserved. After opening the bladder, incision into the prostatic mucosa is not necessary, as a satisfactory plane of cleavage can be found in the prostatic urethra It is not necessary to introduce the hand into the bladder, but it is of great assistance to keep a finger in the rectum. He believes in packing the cavity with gauze, as being safer and more surgical than ilepending on hot irrigations. Packing should be wholly or partly removed in twenty-four hours to prevent possible necrosis of rectal wall. Appropriate pre- and post-operative treatment is of great importance in these cases

Dr. Balloci noted that nothing was said of prior cystoscopy in these cases, which by some is considered so important. He is glad to see that the suprapulae operation is gaining in favor, the thinks it fees dangerous, though not practicable in all cases. It is interesting to note the method of commencing enucleation by the way

of the prostatic urethra

Dr. HACNE thinks eystoscopy advisable as a routine, as methods of procedure may be altered thereby. A few years ago he used the permeat route exclusively, though he now agrees that certain cases are best treated suprapublically, it is practically impossible, however, to remove a small hard prostate from above. He advises no badly infected bladders to operate in two stages, by draining the bladder for a week or two, using nearly continuous irrigation. He always packs the wound

DR TOWLER said that in these particular cases cystocopy was not necessary, though he uses it as a rule. He agreed as to the advisability of a two-stage operation in had cases. Many large prostates are not true cases of hypertrophy, but are adenomata, the prostate itself being pushed aside. By the procedure described, the ejaculatory duets are preserved and in the four cases mentioned sexual power was retained. DR. TRUMAY ABBE read the paper of the exemptions of the paper of the exemptions.

ing entitled, "How can we improve the results of our operations for cancer?" (See p. 185).

In discussion, Dr. CARR said the subject was timely, as cancer is unquestionably on the increase

all over the world, it is possible that modern methods of life, with overcating and overwork, may cause a precancerous condition. Trauma may be an immediate cause, but only in a case with the already developed tendency. One reason for incomplete operations is the leaving of too much skin, especially in breast cancer, as pointed out especially by Halstead. He has always freely used bichloride in these operations, with a view to destroying detached cancer cells. The great question is that of operability, and he thinks we should hesitate to pronounce a case hopeless There is a great field for the education of the general practitioner in the diagnosis and prognosis of cancer

In G likown Milled Richtler Richtler and Jacob and Alled Richtler State Richtler

the protession and the public

Dr. HAGNER said that many bladder and presatte cases had had symptoms a long time before any positive attempts at diagnosis were made, whereas the only hope was in a very early interference. If a radical operation cannot be done, it is probably best to do nothing at all, as interference seems only to accelerate the growth.

De Tromas Charles Marin urged the importance of processorio examination of every marked ease of constitution or diarrhea or both. The usual finding is a more or less irregular mass, above the levator, which may or may not bleed. An apparent mass, due to rettile with local induration, may disappear on dilatation.

DR FOWLIR said that many cases of prostatic hypertrophy showed areas of malignant degeneration, usually situated deeply in the gland and removed with it, especially in the hard scirrhotic type. He agrees with Dr. Hagner as to stirring up a hopeless tumor, whose growth is usually slow. As an interesting fact, he had never seen cancer of the penis where there bad not been an adherent prepuce

DR. ABBE in closing said he wished to emphasize the importance of education in the cancer prob-

lem, education had heen of such value in tubercu-

losis and other health problems, and that the public is now in a receptive mood toward trustworthy information on all such matters, he hoped that a concerted effort would soon be made in that direction

CORRESPONDENCE

GUNSHOT WOUNDS OF THE CHINESE WAR

The total casualties in the recent civil war in China may never be determined. The Chinece leaders say they do not know The forecan doctors and others who did Red Cross work at Hankow estimate that those killed number 10,000. These men did field work and manned the base hospitals Moreover, thousands of the dead had to be buried under foreign supervision, and so this estimate for Hankow may be taken as outle near the truth

as quite near the truth.
But how many wounded there were it would be still harder to say. One doctor of the Shanghai Red Cross Society who spent a short time at Hankow estimated the number of wounded at Association who were at work from the beginning of the war till the close say that its impossible to name any definite number. About 10,000 wounded were treated in foreign hospitals in Hankow. Hanyane and Wuchang.

Mulitary equipment Both armses were equipped along modern lines The nucleus of the Imperial army was built up by Yuan Shi Kai over ten years ago The men had modern rifles, field guns, and large cannon, and they were trained in their use They were disciplined and there was no needless exposure to gun fire in hattle Their uniforms and first aid pockets were ample compared with those of their opponents, the Republicans The Imperialists used a 27 mm rifle made in Shanghai and Tientsin built after Mauser and Mannhcher models The length of the bullet was something over 3 cm It was slightly longer than that used by the revolutionists, and it had a truer nose In their machine guns, they used 32 cal bullets, sharp and conical pointed. The first aid packet contained gauze, adhesive, and one triangular bandage with diagrams showing its use printed on the wrapper

In comparison, the revolutionary army was

hastily gathered together And, while far larger in number, the soldiers were poorly trained in military tactics and in the use of guns They received more wounds and their firing was less effective than their opponents' "One dead Imp means two dead Reps," was a common estimate made The revolutionists used a model SS Mauser rifle of 312 caliber The bullets were thick, short, and blunt Five hundred, 45-70 rifles using lead bullets were issued to the revolutionists Bullets of hard wood, about 4 cm. long, stained indigo, and mounted in cartridges having a full charge of powder were sometimes found on, but never in, the republican soldiers They were not provided with first aid packets personal equipment consisted of what they could

Field work. The field workers were supplied with bandages, gauze, splints, morphine, and nodine A five per cent solution of iodine was applied to all wounds. In from one to twelve hours, and sometimes longer, most of the patients were carried off the battlefield and carried into the base hospitals. Coolies were used to transport the wounded to and again from the Red Cross launches which were used to convey the wounded from the several river points to the base hospitals in the foreign concessions of Hankow. The doctor in charge of the field work had opportunity to observe also the work in the base hospitals, and he found no bad results accruing from iodine, even in cases where considerable absorption undoubtedly took place, as in shrapnel wounds The splendid results from a free use of iodine, both in first aid work on the battlefield and in the hospitals, made many of the Red Cross doctors stanch preachers of the gospel of iodine

Base hospitals Fortunately, in Hankow there are a number of large mission hospitals, also an international hospital, whose doors were thrown

open to the wounded soldiers of both sides indiscriminately. A large eatherst was also used for a time for minor caves. The medical missionaries assumed a large share of the work, specifying the model of the conference of both armies. In addition, there were the private practitioners who gave themsels es untilingly, as did a number of doctors from the various gunboats of different nationalities. At the height of the fighting there were eight permanent or temporary hospitals at work. In some were soldiers of both armies.

Kinds of usunds. High velocity rife bullet wounds were the most frequent. Shapped wounds were the most frequent shapped wounds were more frequent among the Republican ranks than the fimperalist. Recause of the manner in which they were inflicted, buyonet wounds were fatal and almost never brought into the base hospitals. The same may be said of those wounds made by short knives in which the jugular vein and the common carotud artery were cut. There were quite a number wounded in the back, who, because of poor training and disaptime, were shot accadentally by

excited comrades in the rear

Wounds clinically The rife bullet wounds, generally speaking, were of three distinct types The damage done by the sharply pointed machine gun bullets was small unless a vital organ was affeeted. Infected material was seldom carried The openings through the skin were remarkably small. The wounds usually were clean Many healed by first intention The regulation rifle bullet of the Impenalist equipment did greater damage But the worst wounds of all were those inflicted by the blunt-nosed, thickbodied bullets of the Revolutionists Clothing was more often carried in The holes through the skin were larger. There was a more extensive mutilation of the soft tissues. When bone was involved it was usually comminuted or crushed, with small fragments lying in the tissues beyond The wounds were more frequently infected, and the cases did not do so well, no matter where they were bit

Injection. There were a number of predesposing causes leading to infection. (a) Cleanlunes on the part of the soldiers was exceptional, owing to the class of men who are always the first to enlist. Even if an attempt had been made to enforce personal cleanliness and other samitary measures, the cold weather and general lack of discipline would have made such a condition impossible. (b) Clothing was more often dirty than clean Some of the more fortunate soldiers had on from three to seven layers of it. As

many new uniforms as possible were issued by both armies, but there were thousands of men who wore their own clothes, which had seen months, and perhaps years, of service, with the result that there were both ancient and modern filth waiting to be earried into the wounds. (c) Delayed transmission was a third factor. The revolutionists were more helpless in this respect than the Imperialists. When it came to fighting close to Hankow, both sides owe much to the work of foreigners residing in Hankow, who had the wounded taken off the field to where prompt and adequate attention could be given them. Of course, there were many shot miles from Hankow Interesting cases came in days after they had been shot. The skin wounds had closed, and there had resulted extensive retention of pus, which had burrowed along the fascial The Revolutionists had no field or ambulance corps Both sides abused the Red Cross badge and were carcless about shooting when the wounded were being taken off the field. With Imperial soldiers, where an amputation was called for at once, it was necessary to get the consent of the company and division commanders before the operation was undertaken

Treatment \ 1 few comments on the usual

treatment may be of interest

There were no attempts at any sort of probing where the billet was deeply buried and no operation was indicated. Tincture of iodine dressings were applied.

Compound fractures were opened and drained as soon as possible Normal salt or weak jodine

solutions were used for irrigation.

There was some gangrene in cases where ne played a waiting game. Dry gangrene usually cleared up nicely. The few cases of moist gangrene caused much trouble

Few abdominal wounds developed peritoritis when left alone, usually in those cases where the patient had been without much food for three or four days. Because of the uncertainty of asepsis, even under the conditions there present, the abdomen was left alone. Many cases, however, had retention of the bladder, which was relieved supraphus along as a last resort hich was relieved supraphus along.

In bullet wounds through the chest, the white of a raw egg was drawn up into a syringe and without further preparation injected into the wound

There were three cases shot through the heart that got well. In a number of others, the diagnosis was not fully established.

This was the star case of the war: An Imperial soldier got in the way of his own machine gun

and was wounded in twenty places. He was shot through the jaw, the shoulder, the abdomen. the femur without a fracture, and the heart. The patient lived W. W. PETERS.

Kiukiang, China.

To the Editor: The undersigned is very greatly interested in the subject of "Pregnancy after Oopherectomy," and would appreciate certain information from readers of your journal who have had cases of this kind, and care to favor him with an account of the same. The facts desired involve the question of the relief of sterility following this operation, the character of the labor where pregnancy has occurred, the indications for removal of the ovary, the pathological condition of the same, an account of any other operations done at the same time, the character of the menstrual period subsequent to the operation, the date of birth of subsequent children, and their sex.

A blank form has been prepared which embodies these questions and which will be forwarded in reply to a post-card request addressed to the undersigned.

> Yours very truly, GEO. W. KOSMAK, M. D.

23 East 93d Street, New York City.

Dr. Franklin H. Martin,

Dear Doctor: You will be interested to know that Gauss of Freiburg has just sent me his book of 332 pages, covering 200 cases. Is there any place in your journal where a footnote could be put in to this effect, and as an answer to a number of inquiries that have come to me concerning my article, to-wit: "The Last Word on the X-ray in Gynecology." The new book by Prof. C. J. Gauss and Dr H. Lembcke is "Rontgeptiefentherapic, thre theoretischen Grundlagen, thre praktische Anwendung und ihre klinischen Erfolge ander Freiburger Universitats Frauenklinik,"published by Urban & Schwarzenberg, Berlin, and Vienna, pp 332, price, 15 marks In the trip of the American Gynecological Club, the work in this clinic was more advanced than any that was seen.

ROBT L DICKINSON

BOOKS RECEIVED

TEXT-BOOK OF GENERAL AND SPECIAL PATHOLOGY By Henry T Brooks Philadelphia F A Davis Co, 1012

ZUR KENNTNIS DES UTERUSLARZINOMS By J Schott laender and F Kermanner Berlin S Karger, 1012

THE PLACTICE OF OBSTETRICS Fourth Edition Revised By J Clifton Edgar, M D Philadelphia P Blakiston's Son & Co , 1912

A SYSTEM OF SURCERY Vols I and II By C C Chosee B Sc, M D, F R C S London and New York Funk & Wagnalls Co, 1912

THE PRACTICE OF DENTISTRY By Leo Greenbuum, M D, D D S, and Max Greenbaum, D D S New

York D Appleton & Co 1912 ANASTRETICS AND THEIR ADMINISTRATION, FOURth Edit tion By Sir Frederick W Hewitt, M V O, M A, M D

London Macmillan & Co , Ltd , 1912 THE SURGICAL CLINICS OF JOHN B MURRHY, M D., Mercy Hospital, Chicago Philadelphia W B Saunders

Co, 1912 HEALTH AND LONGEVITY TEROUGH RATIONAL DIST

By Arnold Lorand M D Philadelphia F A Davis Co, 1973

GENTIO-USENARY DISENSES AND SYPHILIS, Third Edition Revised By Henry II Morton, M D Philadelphia F A Davis Co. 1012

Destructed Vol V. Practical Medicine Sense Joseph B De Lee, A M , M D Chicago The Year Book Publishers tota

FOOD IN HEALTH AND DISEASE, Second Edition By Nathan S. Davis, Jr., A. M., M. D. Philadelphia P. Blakiston's Son & Co 1012

SET GRAFTING By Leonard Freeman, B S, M A, W D St Louis The C V Moshy Company, 1912 ARTERIOSCIEROSIS By Louis M Warfield, M D

St Louis The C V Mosby Company, 1912 THE COURSE OF OPERATIVE SURGERY By Prof Dr

Victor Schmieden Translated by Arthur Turnbull, M D New York William Wood & Co. 1012 COLLECTED PAPERS BY THE STAFF OF ST MARY'S

HOSPITAL - MAYO CLYNIC - rott Philadelphia W B Saunders Co , 1912 ANALYTICAL AND DIFFERENTIAL DIAGNOSIS OF THE DISEASES OF THE NERVOUS SYSTEM By Henry Hun,

M D Troy, New York The Southworth Company,

BOOK REVIEWS

A Cyclopedia of American Medical Biography From 1610 to 1910 By Howard A Kelly, M. D. Phila delphia and London W. B. Stunders Co., 1912

The idea of the hiography is to be commended and is but another illustration of the versatile genus of its distinguished author. The work is in two volumes and hiographies of over twelve hundred noteworthy figures in medicine are included. The details of such a work of necessity must be entrusted to many associates, and there is no doubt that the second edition will contain many important additions made necessary by the omissions in the present work.

The following men throughout the country have collaborated with the author in securing the material presented in the edition and have assumed the responsibility of gathering together the biographical sketches of the men from the nortions of the country.

which they represent

F R Fackard and H A Kells, Pennsylvania J A Spalding, Manne, H A Kells, New York C S Caverly Vermont, I J Prouty New Hampshire, A Spalding, Manse, H A Kells, New Steine, Connecticut and Rhode Island E T Cornell Maryland West Virgina, H 14 Royster, North Carolina, West Virgina, H 2 Royster, North Carolina, J Subtans, Florida, S D Lamb, Washington, D C, B Foster, Minnesota, C S Sheldon, Wis Coman, L Connor, Michigan, E W Andrews Hands, H & Handerson and A G Drury Olton, B Common, Maryland, E W Andrews Hands, H & Handerson and A G Drury Olton, White Common, L Connor, Michigan, E W Andrews Hands, H & Handerson and A G Drury Olton, White Common, L Connor, Michigan, E W Andrews Henriston, A B Atherton, New Bruns Weis, A McPhall, Quebec, S R Jenkun, Penne Edward Island, Donald V Campbell, Nova Scotta, Wisher Constant, C M Decherd, A McPhall, Park Maryland, C M Decherd, And Origon, J W Taylor, Judho, W R Typton, New Mexico, W B Ewing, Utah, G H Kress, Callofornia, N A Powell, Ontario

DISEASES OF WOMEN A PRACTICAL TEXT BOOK BY Arthur H N. Lewers, M D London and New York Paul B Hoeber, 1912

In offering this new edition of a work long well known and popular in the British Isles, the publishers have presented it in unproved form, the size of the volume having been considerably enlarged Thus, while the author has rewritten many chapters, and added much new matter, the entire work having

undergone revision, even to the illustrations, there has been no appreciable increase in the number of pages. Throughout, the author adheres to his original purpose of offering the practitioner and student a text essentially practical. Therefore the clinical features of the volume have been retained, and from this point of view the arrangement is unaltered. As in previous editions, too, numerous cases are not as more of the control of the control of the properties of the control of

a short discussion of coccygodynia

A full description of the Wertheim radical operation for utering cancer is one of the additions, and the section devoted to fibroid tumors has been largely amplified Both the Webster and the Dudley operation for shortening the round ligaments is offered as is a modification of the original Tait "flap splitting" procedure for perineal relaxation Dudley is drawn on again for his anterior vaginal wall operation in cystocele with urinary incontinence, and for his plate illustrating the menstrual cycle, which is too diagrammatic. In closing up the abdominal wall after laparotomy the author imbricates the fascial layers, as is excellently described by a colored plate Cervical "erosion" is ably set forth but unlike other English authors, Lewers regards it as of relatively little importance, and does not mention it in treating of the etiology of carcinoma No effort is made to reclassify those conditions enrolled under the title of "endometritis," and curettage remains as the operative treatment

Hlustrations are profuse and for the most part cyclient Particularly helpful are the plates in black and white and in colors. Unfortunately the microphotographs disclose the fault usually found in such illustrations, that of loss of definition in the reproduction. The imprint is excellent and, taken altogether, this new edition more than justifies the author's aim to provide a practical text.

CAREY CULBERTSON

TOHOUS OF THE JAWS By Charles Locke Scudder, M D Philadelphia and London W B Saunders Co., 1912

On reading this book one must be impressed with the desirability of the monograph as a means of presenting such subjects

Tumors of the jaws and mouth have not in the past received the attention that their importance menus, and no single publication has so fully and satisfactorily covered the field as does this book. The value of the volume is added to by an article on "Leontiasis ossea" by Dr. Allen B. Kanavel, of Chicago.

The author very properly emphysizes the importance of early diagnosis in new growths of the jaws, in order that mutilating surgery may not be necessary and life conserved. One can find little in the book to enticise and much to commend It is questionable whether the term couls should be retained, however, the author has plenty of precedent for its use Epulis means upon the gum, and when used to designate a connective tissue growth springing from the peridental membrane or from the periosteum, is misleading. The author speaks of ulcerated teeth, meaning abscessed teeth This misnomer is borrowed from the laits and should not he employed. These minor matters are so insignificant that they should scarcely be noted. The illustrations are numerous and excellent, adding much to the value of the publication. The type, paper and general makeup is the very best profession will profit much through Dr Scudder's contribution to a most important subject

THOMAS L GRINER

Baary and Spinat Cord B) Dr. Med Emil Villiger, translated by George V. Presol, M. D., Sc. D. Philadelphia and London. J. B. Lippancott Co. 1912

In translating Dr Villiger's "Brain and Spinal Cord" so that it becomes accessible to American medical students, Dr Dierrol should have the thanks of all those who have to do with the teaching of this subject. The clearness of Dr Villiger's text and the conciseness with which he states the abstruce sin connection with the nationy of the brain and the spinal cord have made it a favorite volume. In the translation of this third edition Dr Dersol has been content to cities us the outgoing with but few chances:

To those who are not familiar with this treative, it will be of interest to know that it is divided into three parts. First, morphology, dealing with the nantomy of the various portions of the brain and spinal cord in general, second discussions of the various pitch tracts, and third, serial sections of the brain-tiem. The book is to be recommended particularly because of the extraordinanity valuable pictures with which it is illustrated. The graphic tracts makes the subject so clear that one hardly needs to read the text if he is at all familiar with the energal facts.

To the student the book is especially valuable, because by means of these valuable pictures he is able to follow the subject, which at best is very difficult of understanding, and to the practitioner a simple review of the pictures will be sufficient to refresh his memory as to these facts

All told, the book makes a volume of over 280 pages, and is a credit both to the translator and the publisher.

LATERAL CCRVATURE OF THE SPINE AND ROUND SHOULDERS By Robt. W. Lovett, M. D. Philadelphia P. Blakiston's Son & Co., 1912

The second edition of this little work, revised and with a new chapter on "The Relation of School Little to Scolosis," is the most complete monograph on the subject in Inglosh. The author has been doing the subject of the results of his studies and experences, as well as the valuable contributions to the subject by others, in a very readable little book. It should be of value and interest to all orthopeds of subject of the subject of the subject has the subject had not subject to often and interest to all orthopeds of small deformities who undertake the treatment of small deformities who undertake the treatment

I L PORTER

A System of Treatment by Many Writes - Vols 1-II of General Medicine and Surgery - Edited by Arthur Lathum, M. A. M. D., and T. Crisp, M. B., B. S. New York: The Marmillan Company, 1913

The idea of having works which consider discuss from the standpoint of treatment seems to be growing in force, the demand coming from the busy general practitioner, who wishes to rush direct to the treatment of some disease without referring to the symptomis pathology, or other items of the complex picture. This may be all right, and perhaps it will familiarize men with the never modes of treatment, but to me it seems somewhat illogent to treatment, but to me it seems somewhat illogent So we with to consider these olimits from the quality of what they offer rather than any particular belief we may have in the correctness of the

It we should seek to entities the arrangement there would be no end, and the reader would find himself regarding the volumes with the due that be could improve upon them in this line, but after going that the could improve upon them in this line, but after going that the editors have had their own troubles, and that this feature is about a sclera as it is possible to be made. And although the reader may be made in the made around the distribution of the grouping, the index is the most thorough and accurate of any look we have or three different heads.

Each subject is treated with a conciseness and clearness that are very commendable, and the reader who follows his text closely will find all of the necessary details present

The illustrations are profuse where necessary, and serve to make the book interesting to those who enjoy illustrations. The articles on the operative treatment of fractures by W. Arbuthnot Lane and on orthopedic surgery by Robert Jones are especially well illustrated.

The print is good, the paper thin and agreeable to handle On the whole, we feel that these volumes will be of great value to many physicians.

WM. R. CUBBINS





E. Wyllago andrews

SURGERY, GYNECOLOGY AND OBSTETRICS

AN INTERNATIONAL MAGAZINE, PUBLISHED MONTHLY

VOLUME XVI MARCH, 1013 NUMBER 3

SURGERY OF THE SPLEEN

BY WHAT IN J. MAYO, M. D. ROCHESTER MINNESOTA

If have acquired a fairly exact knowledge of the function of all the organs contained in the abdomen with the exception of the liver and the spleen, two organs which are closely associated in their physiology and pathology

The liver is essential to life One of its chief functions is to receive the products of gastro-intestinal absorption and change them into tissue building material

The spleen is not essential to life. It performs for the general circulation a function somewhat analogous to the digestive organs, removing from the blood broken-down corpuscles and other material of probable nutritive value, which is sent as part of the portul circulation to the liver for further elaboration It is also concerned in the metabolism of from

In its ontogeny, the spleen possibly goes back to a time before the development of the cerebrospinal nervous system This is indi cated by the fact that its only known nerve supply consists of filaments derived from the splanchnic sympathetic to the capsule stimulation of which causes contraction organ of internal secretion controlled by chemical stimulation through the blood stream, in many respects resembling the liver We may surmise that this form of stimulation has been quite adequate for function other wise the spleen would be more closely associated with the sympathetic ganglia as are the adrenals, the hypophysis, and other bodies of internal secretion The internal secretions of the adrenals and hypophysis produce their effect not only by chemical stimulation through the blood but also by direct action on the sympathetic ganglar which enables a very small amount of secretion to produce widespread results. Loudently the internal secretion of the spleen is not important since splenectomy does not produce sensus results, the associated organs taking up the function

The liver destroys porsons both chemical and bacterial, and stands as a gigantic defense of the general circulation. Bacteria picked up in the portal circulation are destroyed in the liver and according to Adami (1) pigmented areas in the liver are derived from the pigment of slaughtered bacteria Processes in the hver which interfere with function are often accompanied by changes in the size and parenchyma of the spleen, such as the hypertrophied spleen which so often accomnames currhosis of the later, while primary plenic enlargements are sometimes accompanied by secondary cirrhosis of the liver, as is seen in the late stages of splenic anaemia (Banti's disease) It is probable that cirrhosis of the liver is caused by poisons sifted from the general circulation by the spleen, or by poisons from the digestive tract carried by means of the portal circulation to the liver

The celiac axis supplies the blood to the stomach, pancreas, liver, and spleen, showing the primitive association of function, just as the superior me-enteric artery outlines the intestinal tract derived from the midgut and



the inferior mesenteric artery outlines the greater part of the almentary canal derived from the bindgut. All of the venous return from the echac axis, superior mesenteric, and inferior misenteric vessels unite to form the nortal circulation.

Diring the Carly months of feetal life, the spleco the lever and the bone mirrow, as well as the lymphoid and adenoid tisones of the body are all concerned in the formation to lifetal. This jumnific function of the liver is leet at an early period, but is continued in the spleen to some extent throughout file

The spleen is found in all red-blooded vertelerates, and is pecular in that the blood comes in actual contact with the parenchyma of the organ. In the fertus it appears to have to power of producing both red and white corpuscles. Mer birth the fountion of producing red blood corpuscles is probably lost, although the ability to produce white blood corpuscles is maintained. Not only is the function of producing red blood corpuscles.

lost in the spleen at this time, but it assumes the function of a destroyer of the disadte red blood corpuseles. The great size of the splenic artery permits all of the blood of the body to pass rapidly through the spleen, which quickly strains out the broken-down cellular elements as well as bucteria and other micro organisms. The spleen does not appear to have the power to destroy the micro organisms to appear to have the power to destroy the micro organisms are delivered for destruction to the liver through the portal circulation.

In the persertion of this dual function most of the diseases common to the sideen have their origin A great overproduction of white blood corposcles, associated with an enluged spleen constitutes leukamia of the sidenic type. An excess of function in the destruction of the red Idood corrascles produces not only hyperplasia of the sphen but an attending aurmin from which sidenic anamia takes as name. The enlarged spleen, tague cake of malaria; must be considered a conservative hyperidasia in its inception, although in the later stages it become the habitat of malarial organisms which it appears unable to destroy or to deliver to the her for destruction

With the present medicient methods of diagnoses a diseased sphere is not often accurately mapped out until its sare is made manifest on pulpation beyond the free border of the rife. The drep's structure of the qifen and its relation to the stomach colon, and intestine, as well as the left thorax, renders accurate outlining below this time upon to question, and the fact rem dus that in the large majority of cases we have no correct knowledge of the actual roundtim of the spleen until it can be left at the border of the left hypochondrum

SPLENIC ENLINGEMENTS

Mydogenous leukamia Enlargement of the sphere with an excess of white corpusches is a characteristic of myelogenous leukamia, and the microscopic examination of the blood shows a definite picture which is essential to a diagnosis.

The blood of the most primitive animals is white, in a higher stage of development red

blood corpuscles are found, but they are developed from the white curpuscles earliest blood found in the fretus is white, and at this period of development the liver, spleen lymphoid and adenoid structures of the body, and the bone marrow are blood producing organs Leukæmia appears to be a reversion to the embryonic type of blood, in which all of the original blood-making organs have to do with the overproduction of the white cells. just as carcinoma is due to the unlimited production of embryonic epithelial cells, and sarcoma is due to the unlimited production of embryonic connective tissue cells

The leukamic spleen has been removed a number of times, and in practically all of the cases in which the diagnosts was established the patient died promptly as the result of the operation. Lyen if this were not the case since the leukamic spleen is but a part of the general condition splenectomy would be unas arbino

Splenic aniema This condition is probably a definite entity Banti (2), Oskr (3) and later Armstrong (4) describe it as a progressive disease characterized by an enlarged spicen by a reduction in the number and value of the red blood corpuscles and low harnoglobin and often by a reduction in the minber of white blood corpuseles Clinically this disease may be accompanied by hamorrhages especially from the stomach by progressive weakness and often by pigmentation of the skin and chronic jaundice. Banti - disease is simply a late phase of splenic anaemia is marked by splenic hypertrophy with cirrhosis of the liver occasionally numbice and often ascites

The condition of the blood in splenic anæ ma is interesting. As a rule, the red blood corpuscles drop under 4000,000 often to 3,000 000, and the hamoglobin to the vicinity of 40 per cent. The white corpuscles vary from 3,500 to normal The differential count is usually unchanged. After the removal of the spleen the blood picture becomes more nearly normal, although as a rule for some months there are variations at different times When this particular grade of secondary antemia exists in connection with an enlarged spleen and the cardinal symptoms previously

mentioned, a diagnosis of splenic amenda can be established, not upon one sign or symptom, but upon the complete clinical picture, and if the disease be uncomplicated, splenectomy may be expected to cure the patient. We have removed the spleen in eighteen cases of splenic anomia with gratifying results

Perisplenitis may exist to such an extent in association with spleng anamia that the spleen cannot be removed without enormous risk to life. Hepatic cirrhosis with peri hepatitis may also be present in these cases, the liver and splcen often being encapsulated to a remarkable degree. Because of such complications, splenectoms was abandoned in one of our cases. It is sometimes difficult to determine whether an enlarged spleen with circhosis of the fiver is a Banti's disease primarily or whether the splenic hyperplasta is the result of a primary circhosis of the ht er

I ollowing splencetons: there was pain for a time in the long banes in about 25 per cent of our cases, and in one or two cases a temporary enlargement of the lymphatics, evidently a compensatory hypertrophy of the bone marrow and gland- as has been noted by Warthin (s)

There is a type of enlarged spleen of un known causation not accompanied by animus. an essential hyperplasia. I have personally observed two cases in which the enlarged suicen had existed in one case eight years in the other six, with the patients in fair health Conservative splenic enlargements The biologic study of micro-organisms found in the blood is interesting. Bacteria such as tubercle bacilla bacillas typhosis, pus-producing organisms etc. are vegetable parasites and are more resistent to chemical poisons, such as bichloride of mercury, etc., than their animal host, therefore bactericides usually fail to destroy them Methods of treatment based upon increasing bodily resistance through the development of opsonins give the best results in diseases caused by these vegtable parasites. Animal parasites or protozoa, on the contrary, are destroyed by specific poisons, such as quinine for the plasmodium of malaria, mercury for the spiroehetes of syphilis, etc. Both vegetable and



Fig :

NEW GROWTHS

Cysts of the spleen The most common form of non-parasitic tumors of the spleen is the cystic spleen, in the great majority of cases primarily due to hemorrhage within its capsule I refer those interested in this phase of the subject to an excellent article by Powers (8)

Surcoma of the spleen. Sarcoma is the type of primary malignant disease of the spleen and is rare Gaucher (9) described a certain proliferation of the endothelium of the venous sinuses as a neoplasm The tumor of Gaucher must be considered the same type as that of which Weichselbaum (10), in 1881, reported two cases, calling them primary endotheliom is Jepson and Albert (11), found 32 such cases, in which splenectomy was made in 10 There were three deaths and four cures in this series, one alive six and one half and one four years after operation a critical analysis Fowler (12) reduces the 32 cases to 14, which he believes were true sarcomas and the balance nodular hyperplasias McConnell (13) throws doubt on this data, believing that the cures occurred in cases of chronic hyperplasia and not in the sarcoma group Pathologists are divided in their opinion as regards these tumors; some hold that they are sarcomas, and others that they are a type of hyperplasia. Histologically, many of these tumors appear to be neoplasms, but are peculiar in that when they exist primarily in the spleen they are comparatively benign, and if removed early may be cured One patient with lymphosarcoma of the splcen was operated on in our clinic, November 14. 1905, and is in excellent health to-day Three cases of the Weichselbaum and Gaucher type of splenic tumor which have been operated on by us were clinically splenic anamias. Two have remained well since, one dying from the operation.

Splenectomy. It is unfortunate that our main recourse in surgical diseases of the splen is destructive. As a rule, the disease is advanced before a diagnosa is made, and usually the entire organ is involved, making splenectoms the only rational procedure.

The blood supply of the spleen can be rethreed by ligation of some of the secondary arteries in the hilum. Whether this would reduce its function sufficiently to be of practical value I do not know, but it might be tired in some cases in which splenctomy could not be performed. In the somewhat analogous condition of hyperthyroidism, ligation of the thyroid vessels has given remarkable results

For the removal of a large spleen an incision is made in the outer margin of the left rectus muscle extending from the costal arch downward until there is a space sufficient for manipulation For smaller spleens a transverse incision is practicable. On opening the abdomen the hand is passed over the spleen under the diaphragm and if adhesions are present, they can usually be broken down with the hand The spleen can now be brought entirely out of the abdominal incision The fundus of the stomach and the colon come out with the spleen, and these attachments, together with the lienophrenic ligament, etc., can be tied and divided under inspection A large gauze pack is carried up into the cavity from which the spleen has been removed temporarily to check the oozing from the separated adhesions The spleen is then steadied and all of the attachments tied and divided until it remains attached only by its vascular pedicle A rubber-covered elastic clamp of the Lower variety is placed on the nedicle, if possible about three inches from the spleen. If portions of the stomach or colon are caught with the pedicle by the elastic holding clamps no injury will result This

hold prevents slipping and sudden harmorrhage from the great vascular pedicle, and the vessels can be divided close to the spleen into three or four sections and ligated carefully with catgut before the holding clamps are removed

In hypertrophied spleens of long standing the blood-ressels are often atheromatous, necessitating great care in placing the ligatures After ligating the vessels, the clamps on the base of the pedicle are loosened gradualis, the large gauze pack is removed, and the bleeding points in the deep cavity closed with catgut on a fine needle. In one case I was unable to control the hæmorrhage from the under surface of the diaphragm and was compelled to leave a large gauze pack in the cavity, removing it several days later

The tail of the pancreas is sometimes drawn up with the pedicle and, unless care be exercised, it may be accidentally tied in the pedicle and divided. I removed one and one half inches of the tail of the pancreas with the pedicle in one of my cases and did not discover it until I was about to drop the pedicle back. After covering the pancreatic stump with peritoneum, I fastened a one fourth inch rubber tube with a split in the end to the pancreatic stump with a fine catgut suture and brought it out of a stab wound This precaution was, however, unnecessary there being no pancreatic or other drainage, although the pancreatic duct, where it was cut across, was plainly visible.

Accessory spleens, varying in size from a hazel nut to several inches in diameter, are not infrequently found in the pedicle. If the primary disease be benign, these accessory spleens may be conserved

The mortality following splenectomy has been estimated to be from 181/2 to 271/2 per cent Carstens (14) reports 739 cases, with 137 deaths (181/2 per cent) Johnson (15) found a mortality of 274 per cent in 708 cases. Under present conditions the mortality is much smaller than these statistics appear to indicate The operation itself, if the patient be in fair condition, should not have a

mortality of above 10 per cent, and probably not above a per cent In our 27 cases there were two operative deaths

ANALYSIS OF CASES OF SPEENLETOMY Mayo Chec, from April 5 1904 to October 21, 1912

Total splenectomics Total operative deaths

Clinical diagnoses

Splenic agamia (s showing Banti s syndrome) Wandering spleen (recovered) Tuberculosis (dad m 4 months) Permetous anamia (?) (unimproved 21/4 years) Cirrhosis of liver (death within 6 mos ascites)

I otal

Operative results in cases of splenic anamia

Infectious (2) splenomeguly

Operative deaths Well 1 to 7 years Less than 21, years all years

3% years 4 years 51/2 years 7 years

Total

Improved

Death in 3 years improved until shortly before Death 23/2 years after operation cause unknown

Cotal

Pathologic findings in cases of splenic anomia Lymphoid hyperplasis (Lymphoma (?) 1, Lympho sarcoma 1)

Endothelial proliferation (Gaucher type) Chronic diffuse solenitis

Total

RLFLRLNCES

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March 26, 1910 Spleen weight, 1160 grams, exterior smooth, mottled, firm, cut surface hard, fibrous, lymphoid tissue increased, some swelling of endothelium in dilated venous sinuses, marked fibrosis Pathological diagnosis, chronic diffuse splentis

CASE 24 A7040. Male, age 45 yrs Clin diagnosis atypical pernicious ana mia Splenectomy February 9, 1910 Spleen weight, 1640 grams, exterior smooth, rather soft, cut surface soft, dark colored, lymphoid tissue increased, no apparent proliferation of endothelium, slight increase of connective tissue, very large amount of débris of broken-down blood cells and blood pigment

Pathological diagnosis, pernicious anamia

Case 25 H17130 Male, age 10 yrs Clin diag nosis splenic anæmia Not operated, autopsy December 14, 1903 Spleen weight, 600 grams, exterior pale, hard, fibrous capsule thickened, cut surface hard, fibrous, lymphoid tissue almost entirely absent, some proliferation of endothelium, very advanced fibrosis Pathological diagnosis diffuse

chronic splenitis

CASE 26 464259 Female, age 20 3rs Clin diagnosis, splenic anemia Splenectomy February 26, 1912 Surgeon's diagnosis at operation primary hepatie cirrhosis Spleen weight, 750 grams Pathological diagnosis, chronie splenitis
CASE 27 A62258 Female, age 20 315 Clin

diagnosis, painful wandering spleen Splenectoms January 22, 1912 Spleen weight 170 grams, organ, both grossly and microscopically, apparently quite normal

CASE 28 \11038 Female, age 39 315 Clin diagnosis, painful floating spleen Splenectom; June 27, 1908 Spleen weight, 145 grams, exterior rough, hard, cut surface slightly fibrous, pale, apparently slight atrophy of hamphoid tissue, no change in endothelium or fibrous connective tissue. Pathological diagnosis, atrophy

GENERAL DISCUSSION

Group I Cases with a Positive Clinical Diagnosis of Splenic Anamia

Of the 18 cases on whom a positive clinical diagnosis of primary splenic anæmia was made, all presented the important diagnostic symptoms as laid down by Osler (33), namely, an enlarged spleen with the following blood picture a reduced number of red cells, a reduced number of white cells without material variation from normal in the relative percentages of the several types, no leucocytosis, usually a leucopænia, a very low hæmoglobin, and a low color index In all 18 cases, the clinical picture was sufficiently definite to warrant, even after the most critical review, a diagnosis of a secondary anaemia apparently due to a primary spleno-

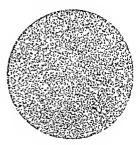


Fig. 1 Case to 2 Splenic anemia Lymphomia type Spl Sec vice, lymphomi area

Of the 18 cases operated on, 2 died at operation, and of the remaining 16, 11 have remained well for periods varying from ix months to seven years Of the remaining 6, 2 are improved, one died 3 years after operation with symptoms of cirrhosis, and 2 have not been heard from

While these 18 cases presented clinical symptoms of such uniformity as to compel the chincian to group them together, the variation in their morbid anatomy is so great that for purposes of pathological description it becomes necessary to divide them into classes as follows

Chronic lymphocytic hyperplasia Class A This class contains two cases Nos 1 and 2 In the first case the spleen weighed 2100 grams and in the second it weighed 3275 grams, or 13 and 10 times the normal weight, respectively (females) In both, the surface was smooth and the tissue was soft and dark red in color On gross section, both were highly vascular, while the bands of connective tissue so prominent in spleens in Class C. were notable for their absence

Microscopic examination of the spleens from these two cases shows in both an enormous increase of the lymphocytes of the parenchyma, with a relative thinning of the



Fig. 2 Case No. 2 Splenic animia. Lymphoma type. Spl. Sci. x100, vessel invaded.

stroma and with no material probferation of the endothelium of the venous sinuses The lymphoid elements have so increased and so pressed upon adjoining structures as to obliterate all evidence of the Malpighian corpuscles, and, to a great extent, of the venous sinuses (Fig. 1) Besides the increase in the numbers of the lymphocytes, we find a large proportion of them swollen beyond their normal size This condition of lymphocytic hyperplasia is so marked as to strongly suggest a neoplastic condition In Case 2. several sections show blood-vessels (Fig. 2) whose walls in limited areas have been so infiltrated with lymphocytes that almost no fibrous tissue can be discerned within them.1 Sections from areas near the hilum of the spleen from this case also show extensive infiltration of connective tissue bands by lymphocytes (Fig 3). These two pictures were so marked that at operation a diagnosis of lymphosarcoma was made from the microscopic slides A recent careful review of the slides made at the time of operation, and also of freshly made slides, confirms this diagnosis from the histological standpoint. A similar indistration by lymphocytes of the arterial walls in the sleep of the normal bat has been noted by Downey and Weidenreich

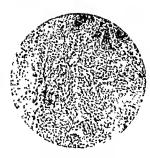


Fig. 3. Case No. 2. Splenic anamia. Lymphoma. type. Spl. Sec. x100. lymphosyrioma.

In the face of this picture however the fact remains that these patients, Nos 1 and 2, who were operated on respectively five and one half and seven years ago, are both alive and well It is thus highly improbable that any neoplastic growth existed outside the spleen in either case at the time of operation When one considers the extent and character of the process in the spleen, it is difficult to conceive how a true lymphosarcoma, as we ordinarily define such, could have so long existed in so vascular an organ without the formation of metastases elsewhere. On the whole, then, it appears that we must materially modify our present concept of what constitutes a lymphoid hyperplasia, or, on the other hand, of what constitutes a lymphoma or lymphosarcoma, before we can place spleens of this type in either class. I am inclined to believe that while, in their final histological aspects, they may become true neoplasms (lymphosarcomata), both developmentally and clinically, their early stages represent only an extensive lymphocytic hyperplasia, with only a slight return of the cells to their primitive mesoblastic type They certainly must be considered as quite distinct from such primary sarcomata of

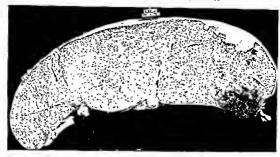


Fig 4 Case No 3 Splenic anamia Gaucher type Spl Sec mottled, marked fibrosis infarcled

the spleen as that reported by Jepson and Albert (18)

Class B Primary proliferation of the endothelium of the spleen ("Gaucher type") Our series contains three cases (Nos 3, 4 and 5), in each of which the spleen presents a picture the most striking characteristic of which is an enormous proliferation of the endothelium of the venous sinuses. Two of these are the largest spleens of our series. No 3 weighing 5280 grams 31 times normal (female), and the other. No 5, weighing 4500 grams, 26 times normal (female) The third No 4, weighed but 80; grams 5 times normal All these spleens presented a rough exterior The appearance of the sections however, both gross (Fig 4) and microscopic of the three cases varies much

Case No 3, which is a typical early "Gau her spleen," will be described later in detail by Dr Franz Wildner of this laboratory, who had made considerable study of the case before the final compilation of the data in this paper was begun

In Case 4 (Fig 5), the relative smallness of the spleen as compared with the other two cases of the class is readily understood on examination of the microscopic sections. There are only a few isolated areas of lymph.

oid tissue (Malpighian bodies) Almost all the venous sinuses are crowded with endo thelial cells, closely resembling the pictures presented in slides from Case 3 (Fig 6). In many of the sinuses, some or all of the cells are shrunken and have lost their definite outlines merging into one another and thus showing that they are not only much presed upon by the connective tissue, but also that they are in an early stage of degeneration At the same time, surrounding the sinuses are broad bands of fibrous connective tissue. which give the appearance of having contracted and shut off the circulation from the endothelium of the sinuses The giant cells in the venous sinuses in this case are so numerous as to have suggested the possibility of tuberculosis which, however has been excluded histologically and biologically The process has apparently been an initial proliferation of the endothelium with a secondary connective tissue overgrowth, causing degeneration of the endothelium and a spleen which while still enlarged (five times normal), is yet not nearly so large as that in either of the other two cases of the class This patient was quite well when last heard from, two and one half years after the removal of her spleen

The spleen from the third case (Fig. 7) in

this class. No 5, is made up microscopically almost wholly of large spaces apparently dilated venous sinuses- filled with what in most of them is a homogeneous colloid mass (Fig 8) In some of the sinuses, however remains of cellular elements can be made out while in a few these elements are still plainly shown to be endothelial cells (Fig 9) rounding these distended colloid-filled sinuses are broad bands of fibrous connective tissue containing here and there remains of lymph oid elements and not presenting the contract ed appearance of the fibrous connective tissue in case No 4 The most reasonable interpretation of the pathological process in this spleen is that of a primary endothelial pro liferation a secondary connective tissue increase, and a colloid degeneration of the endothelium

While so far as I am aware no other observer has reported so extensive a colloid degeneration in a spleen of the Gaucher type it is probable that Marchand's 1(2) tase was no beginning stage of the same process since Marthand notes particularly the peculiar homogeneous hyalin appearance of many of the cells. It is possible, also that the fine hinear markings on the endothehal cells to which attention was first called by Mandel baum and Libman (12), and which were to be made out in all three of our cases, may mark early stages in the process of degeneration in these structures

Weichselbaum's (1) case of "primary multiple endothehal sarcoma of the spleen" was the first case of this type to find its way into the literature Though Weichselbaum omits all clinical data from the report of his case his description of the morbid histology leaves little doubt as to the character of the lesion Gaucher (2) next described a case as "Splenomegalie primitive-Epithelioma primitive de la rate " Williamson's (3) case showed considerable fibrosis of the spleen, with "enormous numbers of large nucleated cells each containing six to ten red blood corpuscles" in the venous sinuses Williamson's description is not as full as one could wish, and there remains considerable doubt whether or not his case was of this type. Collier (4) described the histological changes in the spleen of a case



Fig. 5 (456 No. 4. Splenii anamia. Late Gaucher type. Spl. Sic motifed.

as an endothehoma His specimens, however were reviewed by the "Morbid Growths Commuttee" of the London Pathological Society who noted the enormous number of endothehal cells but thought the condition was not an endothelioma Picou et Ramond (5) next described the lesions in the spleen from a case on which a successful splenectomy had been performed (the first in this group of Bovaird's (9) cases were the first reported in America, and his thorough description of the pathology left little to be added by later observers. He was convinced that the essential lesion was an endothelial hyperplasia and not a neoplasm Following Bovaird, Harris and Herzog (10) reported the first successfully operated case in America. and coincided with Boyaird that the chief histological change was an endothelial hyperplasia The spleen in Rolleston's (13) case showed marked fibrosis and extensive endo-



1)2 to Case No. 4. Splents an emiss. Coucher type, Spl. Sec. 2000 diam. Reginning degree of proliferated endothelium grint cells and abrosis.

thehal probferation Stengel's (17) case, that of a negro who had had more or less pain in the left side of the abdomen for many years and on whom splenectoms was successfully performed by Dr. Clark presented a spleen whose surface was covered with numerous nodules from one to three cm in diameter Histologically there was enormous increase of the endothelium and librous connective There were many grant cells, and the endothelium so intiltrated the connective tissue that Stengel was convinced the condition was a true endothelioma Histologically this case is apparently an exact counterpart of our case No a Springthorp and Stirling (10) reported six cases in one family, on one of whom a successful splenectomy was per formed They describe the morbid histology in the spleen as "a great increase of the libril lar framework of the spleen pulp made up of anastomosing processes of endothelial cells with their rounded or elongated nuclei " The spleen in Umber's (20) case showed numerous denosits of pigment, the venous sinuses filled with blood and many large mononuclear cells with tine pigment granules; and many giant cells in the Malpighian bodies. Mandelbaum and Libman (21 and 31) have made thorough

nathological reports on two cases studied clinically by Brill. They were the first (21) to call attention to the peculiar linear markings to be seen with high power on the endothelial cells They were also the first to call attention to the endothelial hyperplasia in the bone marrow In their last report (11). following the suggestion of Schlagenhaufer (24) and Marchand (25), they concede that the large endothelial-like cells may arise from the normal endothelium or from normal reticulum Indging from the cuts illustrating Mandelbaum and Libman's articles, the endothelial cells are much more closely packed than in our Case 3, while the connective tissue increase is not as great as in our Cases 4 and 5 O Malley and O'Malley (22) report their studies on the spleen of a case which had been operated, and describe an endothelial proliferation and a marked connective ti-suc byperolasia throughout the spleen Schlagenhaufer - (24) case like that of Gaucher, was complicated with tuberculosis. He concludes that the disease is a general one of the lymphohamatopoietic system and thinks it is analogous to lymphosarcoma He doubts the endothelial character of the large cells filling the venous sinuses, and suggests that they may be derived from the reticulum Marchand (25). in the examination of the spleen from one case, notes especially the hyalin appearance of the endothelial cells, saving that it suggests an any loid degeneration. He is in doubt as to the origin of these cells, but says they may arise either from the endothelium or from the

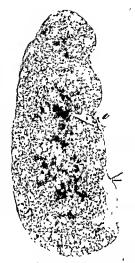
reticulum Krompecher and von Herczel (23) in the study of one case conclude that the spicen was the seat of an inflammators process or a benign new growth and are inclined to the latter opinion de Jong and Van Heukelom (35), in the study of a spleen from a case which recovered after operation, decided that the cells in the venous sinuses had arisen from the reticulum, though they note that the possibility of an endothelial origin cannot be denied The liver in their case continued to enlarge after splenectomy and they attribute this to a proliferation of the cells previously carried there from the spleen, though of course, this is speculative Rettig (32), Risel (33) and

Plehn (34) have also contributed to the literature of this type of splenomegaly. The most recent report is by Mandelbaum (38) who reports a case of a boy 4½ years old who died the next day after plenectomy. The spleen weighed 490 grams. Autops showed the liver and all mesenteric and retroperitoneal lymph nodes enlarged. After a careful study of the histology of this case. Mandelbaum concludes. "It is impossible to deny that a close relation exists between the retroulum and the large cells even though one cannot find evidences of transition stages between them."

From my review of the cases presented in the literature and a careful study of the spleens from our own three cases it seems to me that our best interpretation of the histological pictures presented is that of a primary endothelial proliferation with a secondary proliferation of librous connective tissue and ultimately a degeneration of the endothelium with contraction of the connective tissue The survey of all the cases suggests a close analogy in their histology with what one meets with in hyperplasias of the thyroid and of the prostate, namely an initial hyperplasia of the parenchyma filling the acini, a secondary increase of the stroma and ultimately a degeneration of the parenchyma with contraction of the connective tissue

With relation to the origin of the large endothelal like cells, they appear to me to be much more likely to have risen from the endo theilum than from the recirculum. In this connection, it may not be amies to recall that, though embryologically the sphem arises entirely from the mesoderm, yet soon after the first appearance of the splenic anlage, as a thackening of the dorsomeogastrum, the celomic epithelium covering it becomes arranged in multiple layers, the deeper ones of which change to mesenchy and type and become scattered throughout the sphem

It seems to me unfortunate that the trend of medical thought was originally directed toward the consideration of these endothelial profiferations as true neoplasms, with the associated dread of malignancy, since it has no doubt operated to prevent surgoons from hazarding spherectomy, though, of the nine



1 ig 7 Case No 5 Splenic anæmia Late Gaucher type Spl Sec mottled Colloid deg and adv fibrosis

cases which have been operated on as reported in the literature, four have recovered, while the remaining five were in very bad condition before coming to operation

Class C Primary (chronic) diffuse hyporplasu of the spleen (chronic splenins). In this pathological class are found 13 of our cases (Nos 6 to 18). The spleens are all large, weighing from 425 grams (two and one half times normal) to 1670 grams (nine times normal), with an average of 1689 grams (six times normal). The external surface of these spleens varies in roughness directly in proportion to the development of connective tissue

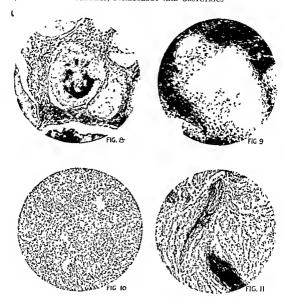


Fig 8 Case No , Splenk an email Late Gaucher type Spl See x100 Colloid deg
Fig 9 Case No 3 Splenk an email Late Gaucher type Spl See x100 Endothel remuns

within the organ On gross section, all of them show more or less fibrosis with dilated vessels Microscopically, there is a diffuse overgrowth of all the tissue elements, lymphoid endothelial, and fibrous (Fig 10) In

Fig. 10 Case No. 13 Splenic an emia. Spl. Sec. 2100. Chrome deffuse hyperplasia. Fig. 11 Case No. 8 Splenic anaemia, with Banti's syndrome. Spl. Sec. 2100 diam. Dilated capillaries and fibrosis.

several the lymphoid tissue is markedly increased, in most the connective tissue increase is very prominent, and in almost all there is some proliferation of the endothelium of the venous sinuses. In all of the cases with

marked connective tissue overgrowth, there is more or less sclerosis and atrophy of the pulp and Malpighian bodies. The latter frequently also show some hyalin degeneration. In several of the cases (Fig. 11) in which the fibrosis is most marked, dilatation of the capillaries and arteriosclerosis are also present. This process is especially marked in three cases which presented clinically the syndrome of Banti's disease and showed cirrhosis of the liver at operation The pathology of this type of primary splenic anæmia has been so well described by Banti (6), Sippy (7), Osler (8 and 36), Wentworth (11), Warthin (16), Marchand (15), Simonds (26), Lyon (27), and others, that further description is unnecessary The picture is that of primary chronic diffuse parenchymatous and interstitial inflammation Whether this process is the result of a local micro-organismal invasion or of a locally acting toxin is undetermined, though hypothetically the latter is the more probable

Group II Cases with a Doubtful Clinical Diagnosis Falling between Splenic Anamia and (a) Infection, (b) Pernicious Anamia, or (c)

Hepatic Carrhosis

In this clinical group are four eases (Nos 10 20 21 and 22), on whom splenectomy was done, and one autopsy case, No 23, and yet in whose histories the element of infection was so prominent as to make doubtful the clinical diagnosis. The spleens in these eases, while enlarged, are relatively smaller than those in the preceding group, ranging from 320 grams (two times normal) 10 1340 grams (eight times normal), with an average of 800 grams (four and one half times normal)

In one of these cases, No 19 the spleen which weighed only 320 grams, shows only an increase of the parenchyma without endothelial or connective tissue proliferation. In this case, not only were the clinical data insufficient on which to base the diagnosis of splenic angenta, but the pathological picture was also not that of the other chaically well-defined members of the group. The patient however, is alive and well, about two years after

operation

In Case 20 the spleen, weighing 640 grams, was soft and showed an increased parenchyma and some increase of connective tissue. There was evidence of old and recent hamorrhage in the numerous infarcts and areas of blood pigment. This case presented chinically a widespread infection of the upper abdomen and there is little in the pathological picture of the spleen to suggest its relationship to splenic anamia The patient died about six months

after operation with symptoms of nephritis and

general infection

In Case 21 the spleen weighed 900 grams, with a rough, nodular exterior, and showed on section dilated vessels and marked fibrosis Microscopically, the fibrosis was found to be quite diffuse, the lymphoid elements proliferated, and there was also some proliferation of the endothelium of the venous sinuses This case was complicated chincally with a doubtful history of tuberculosis and syphilis. Pathologically, one could not distinguish it from members of Group I, chinically splenic anæmia. The patient died, two months after operation, of nephritis complicated by pleurisy with effusion

Case 22 had had Raynaud's disease five years before operation and gallstones were found at operation, at which time also a 1340-gram spleen was removed The surface was rough, hard, nodular, and on section showed a marked fibrosis Microscopically the fibrous overgrowth is found to be diffuse, the venous sinuses sbrunken, with no endothelial proliferation, and there is no marked hyper-

plasta of the lymphoid elements

Case 23 was a male 25 years of age who had been sick for two years At the time he was evamined, a few weeks before his death, he presented an enlarged spicen with a red blood count of 2,000,000. a leucocyte count of 5,200 and hæmoglobin of 67 per cent Later his leucocyte count went up to 13,000 His color index was always one or above. This patient came to autopsy, without operation, through an intercurrent lobar pneumonia. Aside from the pneumonia, the liver was found slightly enlarged and fatty and there was some chronic nephritis The spleen weighed 1160 grams (six times normal) It was smooth, mottled on gross section, firm, and fibrous Mieroscopically, there is a very marked fibrosis and the venous sinuses are dilated, but without any marked problemation of the endothelium

In the list of cases with a doubtful clinical diagnosis of splenic anæmia are two which a fuller clinical review seems to place in a group of atypical pernicious anæmias The first of these, Case 24, was a male age 27 years Splenectomy, February o. The spleen weighed 1640 grams It was smooth, evenly marked, showed but a slight increase of fibrous connective tissue, but an enormous amount of blood pigment and débris of broken-down blood cells The patient died six months later without any material interruption having been made m his chain of symptoms by the operation. The pathological findings in this case suggest pernicious

Case 25. on whom a doubtful clinical diagnosis of spieme anamia or pernicious anamia was made, was that of a child to years of age, who was in a mornhund condition when brought to the hospital and who died two days later without operation. His blood picture presented some of the characteristics of pernicious anamia (r.b.c., 1,013,000; leue, 13,000; normoblasis, megaloblasts, myelomidel pullbox toss; harmoglobin 15
midel by the bar bear recurrent bamerme boxels for a year. At autopsy,
making and small intestines, the only
modified by the bar boxels for a year,
hirge and small intestines, the only
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mod

ras a female 20 years of age on whom a rad diagnosis of splenic anarma was a operation. February 26 1912, the re a diagnosis of probable primary cuelver. A spleen weighing 750 grams are the patient died two months after

ras a female, age 29 years, on whom a amost of painful wandering spicen was perfectiony was performed January 22, sheat weighing 170 grams and apparently a respects was removed

Tas a female, age 29 years, on whom a mous of prinful wandering spleen was recetomy was performed June 27 1008 was grams and showed a some time-ched parenchyma, but was otherwise

was done in both of the above cases

this be seen from this brief descripbeabove eleven cases that three (Nos 2nd 19) which were clinically doubtful aremias were indistinguishable patholter those cases on which the clinical were positive. However, Case 1 subthful history of associated tubercuches 23 of an intercurrent infection were 10, and Case 25 was a child and dealy moribund when first examined at

GENERAL SUMMARY

Pathological study of 18 spleens resist operation in the Mayo Clinic from the 14, 1905, to November 1, 1912, rationts on whom positive clinical of ephenic anemia had been made, that in each spleen there was hypertical energy of the constituent tissue that in two spleens, the lymphoid tissue was so markedly overgrown as to suggest a diagnosis in one of lymphoma and in the other of lymphosarcoma. In three splens, the proliferation of the endothelium of the vnous sinuses was most predominant. In 13 splens, the process was a chronic diffuse one involving all tissue elements.

2. While any case of primary splenomegaly may begin as an overgrowth of the lymphoid tissue or of the endothelium, in the ordnary course of events a secondary overgrowth of the stroma of the gland will later appear, accompanied by degeneration of the lymphoid or endothelial elements

3 The largest spleens are those in which the lymphoid or endothelial hyperplaca is greatest. As the connective tissue overgrows, the spleen may be reduced in size owing to reduction in the amount of the lymphoid and endothelial elements.

4 The roughness of the exterior of the spleen is in direct proportion to the development of connective tissue within it.

5 In primary splenomegaly, a secondary cirrhosis of the liver is associated with great connective tissue overgrowth and degeneration of the pulp of the spleen

6 From what we know of hyperplasias in other organs it would seem unnecessary to assume hypothetically the presence of three different causes for the production of the three

primary histological types of splenic anamia 7 The histopathological picture presented in all three types of spleens from cases of primary splenic anamia seem to be in complete harmony with the hypothesis of the presence of a slowly acting local toxin

8. There are certainly spleens from clinically doubtful cases of splenic anamia which the pathologist cannot distinguish from the spleens from clinically undoubted cases. Yet it must be conceded that the finding of a great hyperplasia of one or all of the tissue elements of the spleen, without other diagnostic lesions cleswhere in the body, is strong corroborative evidence of the clinical diagnosis of splenic anamia.

In conclusion I wish to thank Dr. Franz Wildner of this laboratory for the use of sections from some of the cases, prepared under his careful direction, and which will be more fully described by him in an early forthcoming article on certain features of the pathology of the spleen. I am also under obligations to Dr. H. Z. Giffin for the clinical notes which he has so kindly supplied

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THE EXTENDED ABDOMINAL RADICAL OPERATION FOR CANCER OF THE UTERUS

BY WILLIAM WEIBEL, M. D., VIERNA Assistant to Professor Westbern

THE history of the radical abdominal operation for cancer of the uterus was inaugurated by W A Freund, who began systematically in 1878 with the abdominal route for the extirpation of the cancerous uterus. But the mortality of this operation was so enormous that it was abandoned very soon in favor of the vaginal methods Afterwards taken up again, the abdominal method made considerable progress, when Rumpf dissected first the ureters, Ries proposed the removal of the pelvic lymphatic glands, and Clark exposed the ureters in ten cases for the purpose of removing as much as possible of the parametria.

Such a state of affairs Wertheim found when he began, in 1898, instead of Freund's operation, to elaborate a radical method telying upon modern surgical principles, which should be able to remove not only the cancerous uterus but also the pelvic connective tissue and the regional lymphatic glands

These two points characterize the radical operation: widest excision of the parametria and removal of the pelvic glands. And, what is to be mentioned as a very important point: in order to get out as much parametrium as possible, one has to expose the ureters and to push them far away as a preventive measure.

The technique of the operation is as follows:

Scraping and canterizing of the cancer immediately before the laparotomy without anasthesia, in order to save the patient's heart. Trendelenburg's position Incision in the median line, wide separation of the bladder from the uterns and the vagina, tying of the lig inf nely and rot Dividing the two layers of the broad figament. The preter is to be exposed up to the entrance into the parametrum without isolating it Here the ureter is crossed and covered by the uterme vesels The index finger is pushed through the parametrium between ureter and vessely, thereby isolating the uterine vessels. By these means, the areter is protected during the ligation of artery and vein. By this procedure the whole pelvic portion of the ureter becomes so accessible that it is easy now to complete the separation of the ureter. Separation of the rectum from the vagin i is the next sten

Wide excision of the parametrium, after having nut on bent clamps for the avoidance of harmorthage. Two strong right-angle clamps are now applied to the already i-solated ragina, so that the cancerons tissue is completely endowed, thereby preventing its coming in contact with the wound after the

opening of the vagina

The next step is the removal of the lymph glands. They he along the common line, the external, and the laylogastric iliae, and in the trigonum between both, also downwards to the obturator foramin and lingh up as far as the division of the aortic. We never search ligher than this point for glands and extirpate only enlarged ones for we never found ranger in glands of normal size.

The pelvic wound is alway a drained by jodoform gauze and the peritoneum is closed care fully. But if there is not knough peritoneal material or if this is infected, we refrain from the complete closing of the peritoneum

The ureter plays an important role in this operation. By freeing it from the parametrium it is not always possible to avoid injuries, isolations, or even lesions. It is often necessary to dig the ureter out of the cancerous infiltrated parametrium, so that the uterus shows afterward a deep sulcus, representing the place where the ureter was fixed. Some operators prefet to resect the ureter, when it

is firmly fixed, without losing the time required to di-sect it out; they consider it the only proper way to operate radically. But the micro-copic examination of the resected ureters shows that the cancer involves the ureter wall very seldom and very late. We always prefer to dissect the ureters, even in the most advanced cases, and the number of our resections with implantation in the bladder is therefore small - only 1.5 per cent of all cases operated on. The control of the cases with fixed ureters operated in this way convinced us that our method is right, because we found many of such cases free from recurrence. It is a fact that the nourishment and function of the ureter is sometimes disturbed in spite of all care used during the operation, for the ureter can be isolated, displaced, and bent as the result of the operation. In about 6 per cent of all our cases we got a urcterovaginal fistula, coming in the second or third week after the operation through secondary necrosis of the ureteral wall. Such fistulæ closed themselves spontaneously in 60 per cent; the other case, surviving the operation, got an a-cendant infection with the well-known consequences and complications. Operative treatment is here may oldable, and we prefer nephrectomy to the implantation of the ureter ento the bladder But also without fistula, ureter and pelvis of kidney can be infected as a consequence of the injuries of the ureteral wall during the operation. Many of these cases running a little temperature in the first weeks after the operation are afflicted with uretentis and pychtis

The bladder is often involved by cancer and fixed to the uterus; in such cases the preparation gives difficulties, and it is not always possible to avoid injuries and lesions of the bladder. Here we recommend resections of the bladder, because they are only small complications of the radical operation in contrast to the resection and implantation of the unders.

Very seldom the rectum is affected by can-

cer, and in only a few cases we found it necessary to resect the rectum.

A very important point is the question of the removal of the glands, and a success from the extirpation of the cancerous glands must be a victory of the abdominal method, since it is impossible to remove the glands by vagnal route In 25 per cent of all cases we found cancerous glands, and nearly all of these died from recurrence Notwithstanding, we adhere firmly to the principle of removing cancerous or suspicious glands, and we have now ten cases with cancerous glands being free from recurrence more than five years after the operation These cases could surely not have been cured if they had been operated by vaginal route

A point of great importance is the anasthesia. If it is a general narcosis, it must be as short as possible. In every case not suitable for general narcosis we use spinal anasthesia, or we mix chloroform and ether with oxygen in Roth-Draeger's apparatus.

According to this plan, from 1898 to 1912 we operated 675 cases of cancer of the cervix, the cases of body cancer are not included, being anatomically and clinically quite different from the cervix cancer.

All together, during these fourteen years 1,410 cases of cervix cancer were examined in our clinic. 71 of these refused the proposed operation, 684 were inoperable, and 625 were subjected to the radical abdominal operation Consequently we have, on an average, 50 per cent operability The operability raised from 42 per cent under the first 150 cases to 52 per cent in the third to fifth hundred, and amounts now to 55 per cent under the last 175 cases In regard to the indication for the operation. it is very difficult to explain exactly when a case of cervix cancer is to be called inoperable We have to consider the infiltration of the parametrium, the fixation of bladder and rectum, enlarged glands on the pelvic wall compacted together and eventually palpable through the abdominal wall, and, as a very important point, the general condition of the patient, especially the condition of the heart. cachexia, and the age of the patient

In some advanced cases one determines to a certainty whether an operation is possible or not only by the exploratory laparotomy. First we palpate the glands on the petive wall; if these are large, fixed, hard masses adherent to the big vessels, and if they are located high up along the aorta, the case is inoperable—

the uterus may be movable or fixed. Dilatation of the ureters is no contraindication for the operation, but it is a sign of bad infiltration in the parametrium and makes a resection of the ureters sometimes necessary. Naturally, fixation of bladder and rectum is an unfavorable symptom

If the uterus is left behind, the operation is to be considered an exploratory laparotomy and the case is inoperable, but if the uterus is removed, the case must be classed as radicalby operated.

The greatest detriment to Freund's operation, and afterwards to every other abdominal method, was the high primary mortality. Really our first hundred cases gave a mortality of 30 per cent, but this number was constantly reduced, amounted in the fifth hundred to only 15 per cent, and is now, under the last 175 cases, just 0 per cent, including e ery death in any manner connected with the operation. The women died mostly of peritonitis, paralysis of the intestine, degeneration of the heart, embolus and pyelonephritis—seldom from other complications.

This excellent effect of our efforts to diminish the danger of the operation was not attained by an especially critical selection of the operated eases, it is a success of continually improving the technique and of the correct use of the amesthesia.

Every rise of the operability is connected with an increase of the mortality, and operators with the astonishing number of 80 per cent or even 90 per cent operability report a mortality of 20 per cent and more. Our operability is much smaller than the operability of many other men because our material is especially bad, and we refuse to operate cases which are absolutely hopeless for permanent cure.

Our standpoint in this question is established by Wertheim as follows: We see the possibility of improving the after results in the most exact performance of the operation, but not in the raising of the operability. And the most exact performance of the operation can be attained without increasing the mortality

We could not find that particularly young age or pregnancy simultaneous with the caneer of the cervix, had an unfavorable influence on the prognosis.

In regard to the recurrence, we found nearly all these in the glands on the lateral pelvic wall, seldom local recurrences in the vaginal scar and in the bladder.

We don't expect much of operations for recurrences, and we did just a few operations of this kind

In criticising the results of an operation for cancer of the interus it is necessary to control the cases at least five years after the operation, and we are not allowed to consider a case cuted before these five years have elapsed

Of our 67s cases, 380 are now, at the end of five or more years since the operation, so that we can use them for criticising the value of Wertheim's method. During the same time in which we operated these cases, an examined in the clinic 863 cases of cervix cancer, of which 36 released the proposed operation. 447 were inoperable, and 380, as mentioned, were subjected to the radical operation. Eight of these 380 died from intercurrent diseases, and too were well and free from recurrence at the end of five years. Just one case was lost sight of. In criticising the value of the operation, one has two points of view.

 We have to calculate how many of all cases subjected to the radical abdominal operation are free from recurrence at the end of five years. We call it after results

 We have to calculate how many of all cases examined in the clinic (including the inoperable ones) are well and free of cancer at the end of five years. We call it absolute efficacy (absolute percentage of cures).

In the second calculation, the operability has an important influence on the permanent results

Cancer statistics are then only good if you

can determine the condition of all operated cases. If a case is lost sight of, you have to consider it as a recurrence. If a case died from some intercurrent disease in no way connected with the primary cancer, you have to deduct it; if you can't exclude this connection, you have to put it to the recurrences.

Me calculate our after results as follows: 350 were operated, 8 of these died from intercurrent diseases and 160 were well and free of recurrence; therefore we could permanently cure 43 per cent of all operated cases. If we leave the primary deaths out of the calculation (because they can't come into consideration with respect to the after results), we have 53 per cent permanent cures of all cases surviving the operation.

Calculating the absolute efficacy we get the following results: 805 cases with cancer of the cervix were examined in this fix-eyear period, 36 of them refused the proposed operation, and 8 died from intereutrent diseases; from the rest (819) 160 cases were well and free of cancer 1 it is 105 per cent absolute efficacy, 1 per cent more than we had in the first 250 cases.

With these results we can say that the radical abdominal operation for cancer of the uterus cured permanently a fith of all these cases we examined in the elinic; it cured permanently 43 per cent of all operated and 53 per cent of all cases surviving the operation. In the last 175 operations we have been able to reduce the primary mortality to 9 per cent.

The raising of the operability, the permanent falling of the mortality, and the increasing improvement in our operative technique allow us to hope that we will be able to report much better results in the next years, when our present cases will have passed the fivesear period.

THE RADICAL ABDOMINAL OPERATION FOR CANCER OF THE UTERUS

By JOHN G CLARK, M D , PRILADELPHIA

→ INCE the inauguration of a more radical operation for cancer of the uterus, surgical critics have been ranged on one or the other side of the question as energetic antagonists or ardent sponsors With such a radical operation it is inevitable that the primary mortality must be high, the surgical accidents and sequelæ numerous and more or less distressing; and even among the most optimistic advocates the consensus of opinion has been that unless the percentage of permanent cures is to be considerably increased, it must be abandoned in favor of less hazardous procedures. To Wertheim belongs the credit of having actively carried forward and simplified the technical details of a more radical operation suggested by Riess, Rumpf, and myself. From the first report of his smaller series of cases until the recent appearance of his monograph covering five hundred completed histories, his efforts have been persistent, even in the face of a very high primary mortality His final conclusions are incontrovertibly in favor of the operation as executed in his own hands and those of Zweifel, Kronig, Bumm, Frantz and others While these results have been obtained by a few specialists with a very abundant clinical material, they are not likely to be duplicated, because of technical difficulties by those of lesser opportunities Even in Wertheim's series of five hundred cases the primary mortality is shockingly high, being followed in his first hundred by a thirty per cent death rate, in his second hundred, by twenty-two. while, even in his fifth hundred, it was still as high as fifteen per cent Certainly, this is not an encouraging outlook for men of lesser opportunities to contemplate It matters not for what an operation is performed, there are but few surgeons in America so temperamentally constituted that they can work ahead with great enthusiasm in the face of primary mortality of one in four, or twentyfive per cent, and further, to see the survivors

pass through the trying ordeals of a s ormy convalescence, attended with many grave post-operative sequelæ In the radical operation, it is only through the development of a most perfect technique that the hazards of death and serious surgical accidents may be diminished to even a moderate degree.

It is particularly opportune that this question has been brought before the American Gynecological Society for discussion; for it is now more than a decade and a half since the radical operation was first proposed, and statistics sufficiently comprehensive should be available to help us in deciding whether it offers a sufficient increase in permanent cures to justify its adoption by the great rank and file of surgeons of this country. The universal benefit of any medical or surgical measure cannot be great if its execution is so difficult as to render it highly hazardous except in the hands of a very few specialists.

My experience, so far as permanent cures are concerned, has not thus far sustained my hopes for greatly improved results; yet the criticism of my efforts may possibly be the same as that offered by Wertheim in commenting upon von Rosthorn's first series of cases, which was attended with a comparatively small primary death rate, but a high percentage of recurrences-namely, that this indicated a failure to really effect a widely extended excision of parametrium and vagina. With increasing enthusiasm for the principles underlying this operation, von Rosthorn became still more radical and his mortality quickly increased to a much higher rate; and although he believed that the survivors would show a proportionally greater freedom from recurrences, Schottlander's and Kermanner's recent review of his cases do not brilliantly sustain this anticipation.

In Cullen's comprehensive monograph (Cancer of the Uterus, 1900) the cases of cancer of the uterus operated upon in the

t Read before the American Gynecological Society, Baltimore, 1912.

Johns Hopkins Hospital by various methods were reviewed, and, so far as possible, the post-operative results were accurately determined. My first case was operated upon in the Johns Hopkins Hospital by a more radical method in June, 1895, and during the next year and a half twelve cases were subjected to this measure with more or less technical variations. Through Dr Kelly's generous desire to give me every opportunity to claborate this plan, everal cases were turned over to me for operation.

In all, there were twelve, in some, the glands were removed, in others, there was only a write excision of a vaginal cuff and as much parametrium as possible. There was one operative death. Among the survivors, four could not be traced, one died in three months, one fin nine months, one in ten months, one in thirteen months, and another, four years after operation. Two were alive at the time of publication of Cullen's book, without evidence of recurrence, three and a half years after operation.

Of this series, therefore, we can only assume that the last two cases may be cured Aecording to continental statisticians, the cases that eannot be traced must be counted among the failures. This rule makes it impossible to reach any definite conclusions as to accurate final results in our larger American cities; for the perfect system of police registration in the continental municipalities does not obtain with us, and it is rarely possible to follow patients after they have changed their address twice. This has been noted in the futile attempts to trace several of my cases operated upon in the Hospital of the University of Pennsylvania.

The failure to obtain better results in this first series of cases, and others subsequently operated upon in Philadelphia, casts doubt-upon the efficiency of this more extensive procedure, and, while I still adhered to the principle. If eith that I had either applied the operation to too far advanced cases or that there had been a failure to really effect the widest possible excision of locally involved lissue. With increasing experience, the difficulty and even the impossibility of really executing a truly extensive glandular dissec-

tion caused me to abandon this attempt; for, it unduly lengthened the time of the operation with a coincident increase in primary mortality, as well as an increase in operative mishaps and post-operative complications. Hence, I confined my efforts to the widest possible excision of the parametrium, with as large a vaginal cuff as possible, contenting myself with the removal of one or more glands, if palpubly enfarged, for prognostic purposes. My conviction was based upon the following points:

The ab-ence, as yet, of any known law concerning metastasis, for, as already demonstrated, the glands of the side of greatest local involvement may be free, while the parametrium, or higher glands of the opposite side, may show microscopic for

2 The unreliability of the microscopic ner2 The unreliability of the microscopic
appearance of a gland in determining metastasis; for, a large, palpable gland may be
removed painstakingly from the bifurcation
of the billoss, and prove to be of an inflammatory character only, while an invisible lymph
adicle or a microscopic focus, immediately
adjacent, may be the lodgment place for
cancer cells.

3 The absence of any law as to what type of case gives metastasis. A very limited local process may show wide glandular metastasis, whereas the opposite may be true in the extensive involvement.

4 The peculiar distribution of metastasis in that occasionally a lower group of glands may escape metastasis, whereas those above are involved.

Concerning the question of glandular extination, it now appears evident that if the higher pelvic hymphatic system is the seat of metastasis, it is scarcely possible for the widest and most pairstaking dissection completely to eradicate it. That this foreast has been sustained is shown in Wertheim's report; for, in his large series of cases that had passed over the five-year period, there were only five survivors in whom the lymphatic glands were involved at the time of the operation. All of the rest are dead. I am aware of the earnest contention in favor of this part of the operation by Authorn, Mackenordt, Riese and others, but, in view

of the objections just noted and in the face of the failure of the advocates to sustain their position by a much higher percentage of cures in the cases of glandular metastasis, it is self-evident that at the worst we are makmg but a slight error in this limitation, which will be offset by a lesser primary death rate.

In a monograph of nearly eight hundred pages! by Schottlander and Kermanner are detailed in extenso the cases of von Rosthorn in his clinics at Graz, Heidelberg, and Vienna, comprising in all 256 alidominal operations. distributed as follows Graz, 85, Heidelberg, 77. Vienna, 94 In the first series of twentyseven cases that came under the five-year period, there were 20 per cent cured Of the remaining fifty eight, 24 1 per cent died from the primary effects of the operation, one died of intercurrent disease, and eight could not be located, leaving eighteen alive over two and one half years after operation Von Rosthorn's experience with the radical operation in the Graz Clinic was very unsatisfactory In his laudable desire to give the fairest trial to this operation, he attributed his failure to effect more cures to the fact that he had not excised a sufficient cuff of the vagina.

Upon assuming the directorship of the Hendelberg Clinlc, he endeavored to correct this defect, and at once noted a very decided increase in primary mortality; and, although there was a larger percentage of permanent cures among the survivors, the final results, reckoned from the standpoints of primary mortality plus subsequent deaths from recur rence, were only slightly better than with the less extensive operation in Graz

After von Rosthorn was called to the University Clinic in Vienna, ninety-four cases were operated upon Ten died from the primary effects of the operation, leaving eighty-four for final study. At the time of publication of Schottlander's and Kermanner's monograph, there had already been noted twenty-four recurrences. The remainder cannot be utilized in considering permanent cures, be cause of the short time since the operation

In such a radical procedure, very serious surgical accidents occur, which may so far militate against it as to raise the question as

to whether the game is really worth the candle. The study of eases of eancer, therefore, should not be based alone upon mortality statistics, for the prolongation of life with some wretched operative complication hardly justifies the salvage

Thus, in von Rosthorn's entire series of 256 operations, the bladder was more or less seriously injured in forty-one eases (16 41 per cent) The majority of these fistulæ were repaired at the time of the operation, but several remained more or less permanent for some time Four required subsequent operation, and eleven remained permanently patulous In 6 25 per cent there were injuries to the ureters. In 3 per cent there were lacerations of the rectum, and in one case the obturator nerve was cut, causing permanent crippling of the leg Secondary necrosis of the bladder occurred during the convales cence in 6 25 per cent of cases Secondary ureteral fistulæ were noted in 7 03 per cent of cases Other complications, such as intestinal fistulæ, etc., are recorded in a small percentage of cases

In concluding this review of von Rosthorn's cases, Schottlander and Kermanner do not reach a positive conclusion as to the final value of the radical operation, reiterating the conservative opinion expressed by von Rosthorn in one of his earlier papers published in 1906, as follows "We do not wish to overvalue, nor vet to undervalue, the radical abdominal operation, for we are still in the beginning of its development " Von Rosthorn further stated that, theoretically, this procedure offered the most effective possible way thus far suggested of reaching the best results, but it would still require a long time to arrive at final conclusions as to whether these principles, when carried into effect, really will be justified by better results than the less hazardous methods hitherto in vogue The latest results and the most favorable of all so far as permanent cures are concerned, are those of Kronig, reported by Busse. He gives in more or less detail the results of 59 operations by Kronig in Jena, with 253 per cent ultimate cures

⁷ur Kenntnis des Literuskarzinoms 1917

^{*}Ueber Dauterreuktate bei der Operation des Literuskarzinogies nach den abdominaten Methoden Monats I Geburts u Gynak "Jan., 1912

after the five-year period, reckoned according to Waldstein's formula. Kronig has been very radical in advanced cases, with a very high primary mortality; but the increased percentage of cures may justify his query as to whether we may not hope to reach the best ultimate results by the most radical operation in even the very far advanced cases. Before taking this view, however, we should weigh other considerations, which I shall mention later. His experience in Jena causes him to advance his standard to the very extreme of operability, and he believes that even Werthelm is too conservative in this particular

In attempting to reach a final estimate of the value of the radical operation, one must compare carefully all reports from authoritative sources on other operations von Ott,1 who is recognized as a very skillful technition, compares the radical abdominal, the radical vaginal, and the simple vaginal hysterectomy He believes that an estimate of the value of the three methods should be founded not alone upon the number of the patients which are permanently cured, but also upon the immediate danger which is associated with each method The crux of any ideal operation is a small primary mortality, freedom from operative accidents and post-operative sequelæ, and the highest percentage of permanent cures

In weighing statistics, he compares Wertheim's radical abdominal operation, Staude's and Schauta's radical vaginal method (Schuchart's operation) and his own, the simple vaginal method, as follows:

	Radical Abdem nat Method Wertheum	Radical Vagital Method Staude	Radical Vagnal Viethod, Schauta	Symple Varinal Method v Ott
Cases operated upon for		-		
five or more years	110	58	47	E-93
Deaths following opera-				
tion	27			4
Mortality (percentage)	23 3	15 5	10 1	11
Absolute percentage of				
nutation method?	24 7	2.5	16 7	15.5
Absolute percentage of				
Waldstein	10 16		16.6	

From this table, it is quite evident that although the abdominal radical operation carries an exaggeratedly higher mortably, in the final casting up of accounts, the permanent cures, although very decidedly better, exact a very high primary death toll.

An comparing the Schuchardt method, as executed by its exponent Schaula, with the radical method of Wertheim, we may say with great certainty that its value, as demonstrated in Schaula's hands, has fallen short of the standard set by the latter. The curse reported by Wertheim are 57,6 per cent while Schaula's were only 38 2 per cent while Schaula's were now should be set attained; it evident that the Schuchardt method will never have many exponents; for it requires quite as much skill, is attended with a high primary mortality, and is followed by a very large percentage of post-operative accidents.

Further, it bears the serious disadvantage, which all extensive vaginal hysterectomies bear, that the most critical part of the work is done under touch. Even in the hands of the average skilled operator, it would be attended by wretched consequences.

The primary mortality among German and Austrian operators varies widely, and there are wide divergencies in ultimate results Thus the primary mortality among the leading exponents of the radical operation is as Wertheim, 18 per cent; Zweisel, follows 8.5 per cent, Doderlein, 18 2 per cent; Bumm, 21 per cent; and Kronig, 25 4 per cent. Both Kronig and Wertheim claim that the high primary rate of mortality indicates the thoroughness of extirpation of the uterus, parametrium, and vagina, and criticise von Rosthorn's first series of cases because his death rate was only 6 per cent, and yet, as already pointed out, even von Rosthorn's later and more radical efforts did not bring a compensatory return. Now come the discrepancies which statistics so frequently show - Zweifel, who has a higher rate of operability than Wertheim, a ratio of 45 per cent by one as against 43 per cent by the other, had only 8 5 per cent primary mortality with a permanent salvage after five years of 20 46 per cent as against 18 4 by Wertheim.

These statistics confuse us, and we are naturally puzzled over these wide differences in the hands of men presumably of equal

· Zentralbî f Gynāk , 1909, No. 19

ability. Certainly neither Wertheim nor Kronig are justified in criticising von Rosthorn's bad results because his primary mortality was only 6 per cent when Zweifel, who operates upon 45 per cent of all cases applying to his clinic with only an 85 per cent primary mortality, claims a percentage of permanent cures decidedly better than Wertheim.

I have quoted rather extensively from the statistics of these leading gynecologists in Germany and Austria, for the radical operation has been more extensively carried out in those countries than in America.

If an operation, or other therapeutic procedure, is to have a permanent place in our armamentarium, it must be sufficiently easy to make it available, not for a few skilled specialists, but for the great body of surgeons working in every quarter of this and other countries. In these days of low primary percentages attending nearly all the major operations, no operation can possibly gain extensive headway which carries with it a shockingly high mortality and a large number of distressing and disabling sequelx Further, while the continental surgeon, with his large and overcrowded clinics, may ignore the question of mortality in working out a principle, the American surgeon, as well as the American layman, is so temperamentally constituted that the one cannot and the other will not disregard a high primary death rate except in operations of direst emergency The effect upon the lay mind, therefore, must be taken into consideration, for while one may have over 50 per cent ultimate cures, the effect upon the average intelligent citizen is abhorrent if, for this number of survivors, there have been 25 deaths, and for the other 25 a wretched existence, attended by repulsive post-operative sequelæ, followed by a torturing and lingering death We must remember that these cases are not rushed to our hospitals in extremis, but walk in apparently in perfect health The very nature of their disease makes these women secretive, and their friends and neighbors seldom know of their illness until they hear that they have been operated upon Even the survivors leave the hospital, and do not talk of their ills; in-

deed, they are usually kept in ignorance of its true nature. If they die, however, all know about the surgical tragedy In other words, as I have parodied in another paper two lines in Mark Antony's funeral oration - "The evils of cancer operations live after them, the good is interred with their bodies" We have all seen the widespread prejudicial effects of a fistula among the circle of a patient's criticising friends. After all, the layman only counts as the final test of surgery, successful results, as represented by a restoration to health with a maximum percentage of surgical safety The specialist therefore who may even save the largest number of cases may drive away many others through his unavoidable high death rate and surgical accidents incident to this salvage. With this view of the situation, no one should be censured who regards with favor von Ott's opinion - that an operation, such as a simple vaginal hysterectomy, with a very small primary mortality and almost no complications, is preferable when one casts aside the purely surgical consideration and takes into account the layman's estimate of results The population with which we deal is quite different from the great stream of humanity flowing into the German and Austrian clinics, for there, the peasant population is u-ually ignorant and its afflicted members stoically accept their fate, whether it he good or bad It is possible that when we make a final summary of our combined experience we may have to accept the conclusion that a less radical operation, even though it ultimately saves fewer cases, may be preferable when attended by a low surgical mortality and few or no operative sequelæ. What will be infinitely better and what we ardently hope for is that the present operation, which embodies correct principles, may be further improved and thus eliminate the high mortality now generally attending it. The gradual lowering of the death rate in many hands offers the forecast that we may yet achieve better results If this follows, every argument will then be in favor of the radical operation until some other more effective means of combating this disease supplants SUMMARY OF CASES OF CANCER OPERATED
UPON BY ABDOMINAL HYSTERECTOMY OF
A MORE RADICAL TYPE IN THE GYNECOLOGICAL CLINIC OF IRE UNIVERSITY
HOSPITAL:

In the study of my cases, I have included only those patients operated upon in the University Hospital, because the records of these cases are much more complete than those in other hospitals with which I am associated Even here it has been impossible to trace all of these patients, thus Jeaung a considerable hitatus in the final summary of results

In this review it will be seen that the operative accidents—such as heatiles supportation of the abdominal incision, etc., have been about the same as those noted by other operators. Briefly summarized my results are as follows.

CARCINOVA OF LERVIN

Total number of cases Operative deaths peritonities) Died from recurrence to 3 months Died from recurrence in 6 months Died from recurrence in 10 months Died from recurrence in 1 months Died from recurrence in 13 months Died from recurrence in 18 months Died from recurrence in a years Unable to trace Alme and no sign of recurrence -One year One and one balf years Three years Four years Four and one half years Six years Total

,

2

5

Post operative sequely —
Supportion of abdominal incision Cystiss
Pertonus (recusers)

Perstonitis (recovers) l'reteral fistulæ l'esical fistulæ Phlebitis

Laceration of rectum (hetufs)

Rectovaginal historia

These accidents largely occurred in the advanced cases in which the bladder or rectum were so closely involved as to render them almost unavoidable. Unfortunately, one frequently cannot determine before the operation has advanced beyond a point where it is impossible to abandon it, the degree of cancerous extension; consequently all operations for cancer of the cerves must

inevitably be attended with greater riks than in any other gynecological disease requiring hysterectomy.

However, in every series of cases thus far reported in which the radical operation has been employed, the surgical mishaps and pesoperative sequelæ of greater or lesser estant have been relatively much larger than in the reports of simple his terrectomy cases.

CANCER OF FUNDUS

Merely for the sake of comparison, I include a series of thirteeen cases of cancer of the fundus operated upon by a simple hysterectomy. As a rule, we have made to attempt to effect a wide di-section of the parametrium, and have not removed the illuc glands. The difference in results between can cer of the fundus and of the cervix is so startling as almost to persuade us that they are of an entirely different nature, for one, even when quite extensive, may be permanently cure by a simple hysterectomy, whereas the other may quickly recur, even when it but lightly involves the cervix, even after the most ridcal cemoval We therefore expect good results from comparatively simple operative measures with the one, while the other gives us our worst surgical records

\$10/71 10 435/AD

Total number of cases

Operative death (This patient died one week a. if
operation from a general metastasis of chonoepithelioma. Death occurred from widespeak
myokement of the lungs with the realignant process.)

Mell over set 5635.

Well over four years
Well over four years
Died after five years from recurrence
Died from continuance of disease in seven months

Died from recurrence in three years
Died from recurrence in one year
Died in two and one half years from masterd aboves
(Complete putters, the relief no management three of

(Complete sutop-) revealed no muro-copic trace of cancer either in privis or in the abdominal http:// gland-)

As my cases stand they prove little or nothing. Certainly, they do not offer substantial argument for a radical operation as I have performed it, for, in my list of casonly four are alive after the five-year period. One might favor the proposition that, of the six flost sight of, a proportion at least may have survived. This would be mere gueswork, and I accept the standard set by our German confrères that the cases not accounted for cannot be utilized for statistical study. To count all lost cases against the operation is, however, hardly fair; for, it is impossible in this country to trace a more or less nomadic population, which has no police or other permanent recistration

There has been a primary mortality of a fraction over 8 per cent, which argues in favor of a less radical operation than that of Wertheim, whose mortality has been much higher, and yet Zweifel, from whose experience I have already quoted, had in his series of cases only eight and one half per cent mortality, but claims, nevertheless, a greater percentage of cures than Wertheim I willingly grant that Wertheim has been more consistently radical than I, for I have varied the details of my technique, always with a hope of keeping the primary mortality within reasonable limits, and yet effecting a sufficiently wide extirpation of vagina and parametrium

These cases at least prove conclusively one point, and that is, there is no middle-of-the-road policy. Either the operation must be extremely radical, with a considerable primary mortality and many distressing sequelze with a larger number of ultimate cures among the survivors, or, on the other hand, it must be a much simpler technique, with a minimum primary mortality, few sequelze, and a much smaller curative basis

So far as my own experience is concerned, I may say as did von Rosthan that I am neither elated nor yet depressed in my failure to achieve better results Certainly, the modern American surgeon has no reason to grant that his continental colleagues possess superior skill or a better technique than is in vogue here. Possibly a greater concentration of material in a smaller number of large university clinics may give a wider experience among a few skilled operators, and the earnest educational propaganda among the laity in Germany and Austria concerning the early signs of cancer may cause a larger number of patients to consult the surgeon in the earlier stage of the disease. As the matter now stands, the combined statistics favor the further trial and perfection of this principle

among those who are well prepared to carry it out in the most skillful manner

From a review of the literature and from personal experience, I would offer the following summary concerning the radical operation:

- The operation, in expert hands, notwithstanding its high primary mortality, has given the greatest percentage of permanent cures of any therapeutic procedure thus far suggested for cancer of the cervix.
- While the above conclusion is true, the general adoption of the operation, in view of its dangers and difficulties, is not to be advised until the primary mortality can be reduced to a much lower percentage by a simplification or perfection of details.
- The abandonment of the extensive glandular dissection is justified, because this detail adds to the bazards and does not sufficiently raise the percentage of permanent cures
- 4. The cardinal advantage of the operation lies, first and above all in the excision of an extensive cuff of vagina and the widest possible removal of the parametrial tissue.
- 5 There is no middle-of-the-road policy in cancer of the cervix. The surgeon would better perform a simple vaginal hysterectomy or a high amputation of the cervix with extensive cauterization than to attempt the radical operation if he is not prepared effectively to execute its details
- 6 The earnest endeavor by many specialists, with the improved ultimate cures in a few hands, offers the hope that a further simplification and perfection of details in this operation may yet make it more generally available.
- CASES OF CANCER OF THE CERVIX OPERATED UPON BY THE MORE RADICAL ABDOMINAL HYSTEREC-TOMY IN THE GYNECOLOGICAL CLINIC OF THE UNIVERSITY OF PENNSYLVANIA

No 34 Case 1. 12-13/1-1800. 32 years; marned 7 years No para. One miscarriage. Uterine coluc with meteorrhagis Examination. Epitheliona of cervix Operation. Curettage and cauterization of cervix followed by panhysterectomy six days and began to a proper of the company of the commonth. Wound then closed with the property of Later passed small gause pad by rectum. Enlowing this, rapid coavalescence. Result. Discharged 4-14-co. Died two years later from local recurrence. No 125. Case 2 6-6-00. 35 years, married ry years 1 para Irregular fron lor last two years, excessive for last year. For last month or more had profuse hemorrhage with excessive malodrous discharge Examunation. Cauliflower carrinoma, himted to the every on the right side but has extended into the vaginal lorniz on the left Uterus Irrely movable Operation. Hyster-ectomy, combined abdominal operation following cauchail plan of thereim and Worder, culf of vagina and plan of Wetherim and Worder, culf of vagina structure of the properties. Retail, 18-10-10, 19-

No 199 Case 3 10-29-00 63 years, marned Examination Carentoma of uterus, outlet senile and greatly relaxed Cervir pathlous, cauhflower growth Fundus of uterus normal in size and position Operation Pambysterectomy Considerative Peritonitis Result Distance.

No 344 Case at years, married (bistory mocomplete). Examination Carcinoma of cervit extending into broad ligaments. Operation III, secretionly Too far advanced for any hope of cure. Comisiosease 62-0-01 emblose possibility of the complete of the complete

No 384 Case 5 0-19-01 30 years, matted to years 3 para Profuse bleeding with mid odrous discharge Examination Early carcinoma of cervix cauliflower type Departum Radical hysterectomy. Contalessence Stormy convalescence peritonitis Recovery Result Patient altre oxer 5 years from time to operation

No 420 Case 6 10-27-1 36 sears, married is years 2 para 1 miseratrage Malodorous discharge and menstrual periods have been profuse and too frequent for as months Etomination Cauliflower growth of the cervix Operations, para in right side of abdomen, and right have yearly charged with 2 urnary fields, give her a bursain sensition. Unable to locate patient

No 632 Case 7 6-23-02 40 years, no history Examination Extensive ulcerative greath of cervix Parametrial involvement Operation, Hysterectomy, Large lymph gland removed

Result Could not be traced.

No 671. Case 8 8-20-22. 54 years, whilom married 20 years No para No miscarriages General pain in lower abdomen Paunful mietu rition. Examination Adenocarcinoma ol cervix. Operation. Panhysteretomy. Result Death on second day after operation from general pentonitis (8-27-20)

No. 706. Case o. 9-29-07. 44 years, married 19 years. 3 para Bleeding constantly for a month. Felt weak and had fainting spells Exonuntum Carrinoma of cervix with hydrosulpur Expansion of cervix and hydrosulpur Expansion Countertain of cervit, and par hysterectomy (10-11-01) Convolences to be eventful Result. Discharged 1r-7-02 periodly well. 6-22-04 hard mass in right that repon Detent died 2 years after operation from general metastasis

No 731 Case 10. 10-10-02 37 years, marned 5 years is para Flow became tregular 6 months ago Later profuse hemorrhage Mal dodrous Exomenaton Caulhower eancer of crver Operation Hysterectomy. Glands patper of the Carlos Considerate Stormy, appropriate Hall acresson Considerate Stormy, of uncterovaginal fistula, closed after patient returned home. Result Patient died 12-13-19

extension of cancer into bladder

No 007 Case rt. 5-11-03 at years, mar ried 20 years 4 para Pickie pain for three year very severe on walking. Pans down left they have the deg, diagnosed as the unation. Recently harmost from uterus light red in color. Examination Carva large and soft with frield his mass. Tenderoes and induration along left broad ligament. Opposition of the color of the

No 1060 Case 22 10-10-03 47 52871, misried 28 52875 6 para No symptoms up to three months ago when patient began to have free bleed ing Examination. Carcinoma of the cerew Operation Hysterectomy Removal of consider tele

No 1437. Case 14. 6-26-26. 13 pars; marned 25 years 3 para For the last ro months constant irregular bleeding. Great weakness from 100 sof blood. Examination Very early carcinoma of the cervix, which had not extended to surround the control of the control of the control of the preparaty. Sent of fisherd Operation Illy irrectionsy. Extensive area of vaginal involvement but no extension into broad Iganents. Pelvit glands not palpable. Considerate. Normal Kental. Present date, patient alive and well sarce

the operation.

No. 1379 Case 15 12-13-04 42 years, marned to years. For 6 months periods have occurred
every 2 weeks. Examination Large cauliflower

mass springing from fip of cervix. No induration of parametrium Operation. The limitary causeriation, followed immediately by abdominal hystericorys: Right angle-clamps of Wertheim employed in this operation. Counditesence: Infection of stume following operation stume, following operation and the property of the prop

No 1700 Case 16 1-11-05 53 years, mart red 33 year 7 para Blood-tinged leutorrhea of two months duration Learning Cervical actinoma Operation Learnington Cervical rolling with marked leucoycious. Suppuration of wound Result Discharged 2-15-05, general condition excellent 4-17-10 inocip patient idned from

general metastasis 18 months later No 1008 Case 17 8-31-05 47 years, mar

ned 2 para Excessive utermic bleeding. Luminotion Carticomon of cervis, completely desireding corvix. Operation Illysterectomy Vipparent metastasis to sigmond floxure, possibly may be perioditis. Inflammatory Controlescence very stormy. Severe perioditis. Intense, cystilis. Patient in bosopital 40 days. Regult. Her physician writes that she left his care and he has been unable to trace her

No 1976 Case 18 11-2-06 20 years, marred 23 years 1 para Fahing health for 2 years Vagnal discharge constantly for 5 months Lost 40 fbs in weight Examination Caronoma of uterus Bleeding on examination from extensive crater of cervis Operation Fanhysterectomy Convoluence Uneventual Result Discharged 12-27-06 perfectly well Fatient died is months

later from internal metastasia

No 2050 Case 10 2-1-07 49 sears, morned 30 years 3 para Constant pain in horlett quadrant of the abdomen extending to Ance Leucorthae constant Scanty bleeding spells in last 4 years Examination Cervica exchange Operation Parhysterectomy Rectum punctude during operation lumicitately repaired Conrelescence Philatits Result Discharged 2-23-07. Physician reports patient dive and well

No 1267 Caie 20 '>-16-07 22 years, marred years No para One mescarrage Treated with tampons for three months. Alrays bleeds after removal Exammation Locafazed causfloares carcinoma of cervix Extension into broad legaments Operation Fanlysterectiony. Conlegaments Operation Fanlysterectiony. Concharged Napid and unevential Result Discharged to 1-1009. Died 2 years later of focal recurrence.

No 2300 Case 21 1-77-08 37) cars, married 18 years, 2 para Profuse bleeding 8 weeks ago Smee then continuous discharge with trace of blood. Examination Part of cervix has sloughed away Detrus movable, broad ligaments free Operation. Extensive cervical cauterization, followed immediately by radical hysterectomy. Re-

sult. 5-1-12 Patient alive and well, physician's re-

No 2755. Case 22. 12-4-08. 41 years, married 78 years 2 para. Excessive leucorthea for last six months, varying from white serous to coffeecolored discharge. Extramation. Early caratioms of cervix. No extension to vaginal wall or parametrium. Operation. Radical hysterectomy. No palpable glands. Result. 5-25-12 no recurrence. Patient in excellent besilts.

No 2758. Case 23 12-9-08 45 years, married 25 years 8 pitra 51x months, watery discharge Examination Extensive cauliflower carcinoma, involving entire cervix Operation His terectomy Contribution of severe grade around vaninal wound Result Died 1

year later, focal extension

No 5835 Case 24, 7-14-09 50 peris, marted 20 years No parts I Immeritage two months, yellowish malodorous leucorrhera for three months, yellowish malodorous leucorrhera for three months treely on touch Large cauliflower mass filling argunal forms. Two fibroud tumors of lundau suffer of formaline followed immediately by hysterectomy, of formaline followed immediately by hysterectomy, too far for midned indication. Controllerates the tenses suffering from cystikts and rectivational fixtual Extensive supporation of abdominal increason Result Dred air months fater.

No 3052 Case 75 5"44"-00 53 seats, marned 31 sears 3 para Hregular hemorthage 2 sears, very profuse for last three months Exumnation Prelimnary curettage, excision of cervical tissue for diagnosis, adenocarcinoma of cervical Operation Complete abdomnal hysterections. One eduraged pelvic, by mph gland removed. Result

No 3074 Case 26 10-0-00 48 years, marned 31 years 5 para Yellowsh malodogous
discharge, 3 months Exomnation Cancerous
ulceration of cervix Ulerus ellarged and ulightly
fixed in pelvix Operation Abdomnal hysteretcomy Extension of cancer along uteroastral ligatomy and the control of the control of the control
formalist packing and proposed the control
formalist Particulated 48-26-1-0, internal inchanges
severe pain
Vesical fistula developed some time
before death

No 3687 Case 27 10-17-00 43 years, marned 21 years 2 para Losing weight for 1 years thmost continuous bleeding for four months Examination Cauliflower mass filling yagina, and extensavely twolving cervix Operation. Abdoninal hysterectiony. Wide extirpation of uterus, Addreadin-formalin packing in vaginal vanifold (Glands not plagable Resilt. Could not be traced

No 3133 Case 28 12-5-59 48 years, married 26 years 2 para Profuse discharge with bloody tinge. Examination. Carcingma of cervix. Operation. Panhysterectomy Convalescence. Bladder iriitability. Malodorous discharge from vesicovaginal fistula Result. 1-3-10 discharged Tistula persisted for 6 months, later intestinal fistula developed through abdominal scar. Dicd from general peritoneal metastasis 18 months after operation

No. 1911. Case 29 2-6-10 50 years, wadon 2 para No miscarriages. Milodorous discharge of two or three months' duration Frequency of untanton. Loss of weight and strength Examination Cartinoma of cervit Operation Paniysterectomy. Combilectone Pleurisy Result. Discharged 3-70-70. No bladder unration, but the control of th

No 3392 Case 30 8-3-ro 24 years, married 8 years 4 para Whitish thick discharge for one year Hamorrhage daily for y weeks Examina tion Carcinoma of cervix (infectitual) Operation Complete hysterectomy Contalescence Uneventful Result 4-70-12 physician reports nation time "She is fat feels will and does all

tions continued to the continued to the

rence, antense pain, requires murphine in large doses. Vo. 3506 Case 32 1-17-11 20 years, a para Yellowish discharge and profuse irregular flow, formonths Leanmatian Caulflower factoroms in volving both cervical lips parametrum slightly in volved Operation Preliminary cauticipation Ilysterectomy Result Vo symptoms of ricur rence

No 3693 C3se 33 1-21-11 64 vears, mar ford 15 years 4 parts Severe pann in lower abdomen Continuous ooining of blood Pann in rectal area Marked loss in weight and strength Enamento of Carcinoma of cervit Extensive involvement of cervix and broad ligaments Operation Panhsiderectomy Consuderence Uneventual Postorogne examination showed vessco-weight situals Result Discharged 3-6-12 Vestico-writerio vaginal fistuals persisted Repaired one year later, 18 months later extensive recurrence, death from large vesscal harmonthage

No. 3611 Čase 34 1-30-11 52 5ears, mar ried 27 years, 4 para Since menopause 8 years ago, vagnal discharee, profuse hemorrhage 8 weeks ago Exampation Early carenosa of cervix No palpable parametrial involvement Operatura Preliminary cauternation Hysterections, Gland not palpable. Result 4-76-12 Well, no evidence of local recurrence

No. 3753 Case 35 5-22-11. 40 years, married 13 years 2 para For 6 months periods bave been much more profuse and more prolonged Eramination. Ulcerative crater, involving both higs of cervis, not extensive. No palpable extension to parametrium. Operation. Pelaninary cauterization. Hysterectomy. Extension to lymph glands and both rilar fossær. One or two glands removed. Showed metastasis. Revult. Died 1:11-11. Cancer rectured, invaded bladder and rectum. Intense palin in his er gent.

No 3578. Case 36. 8-24-rr 40 years; married 6 years. 5 para. Symptoms for 8 weeks. Examination Laily carcinomalof cervit, not extending to vagina or into hroad ligaments. Operation Complete abdominal hysterectomy. Conclustence Uneventful. Result. Well, with no sign of recurrence, 4-37-21.

CARCINGMA OF FUNDES, SIMPLE ADDOMINAL HYS-

No 3.70 Case I 4-13-01 42 years, marted 20 years a para. Persods every two weeks and very prostuse. Time of bleeding increased from I to ro days, passed many elects Zemmeine, Myoms usen with caranoma of cervis. Operations, Supravaginal myometeomy and balateral appendertomy, left opporectiony and appendertomy of considerance. Leventiful Remil Duckmyde 5-4-10 with a low-grade philotius of the left leg. Pattent well over six yrans after operation.

No. 37 Case 2 34-02 (magnet), married 22 years 1 prin 9 months ago began to have severe uterane bleeding, which continued up to the present time. Examination Wiensenlage large amount of brain the traverse to fundis Operation Simple bysterictions. Cantalescence Satisfactory Rettil Present date, patient alive and in good health.

No 0.24 Case 3 -26-03 50 verts, single Symptoms not given of fundus Operation Abdominal bysterectomy. Convolescence Uninterrupted Result Patient living and well

No 1077 Case 4 11-0-03 55 Jears, marmed 37 Jears 1 para No abnormal mematural symptoms up to 55 years Large ovarian eyst indication for operation Examination Caner of the fundus was found on pathological examination Operation Simple hysterectromy Removal of ovarian cyst Committeence Normal Result Persent date, patient well, no recurrence

No 1524 Case 6 5-17-05 43 years, married 23 years No para Last two months has had profuse bermorrhage Has lost greatly in weight Severe degree of anamia Examination Uterus enlarged; cervix normal Curettage shows friable material, undoubtedly cancer Interstitual cancer Operation. Hysterectomy. Canuslescence. Normal Result, 6-1-1912, patient alive and well No. 1609. Case 7: 10-3-05. 55 years, married Slight leucortheca and dribhling ol blood for a year. Examination. Carcinoma of lundus extending to sugmoid flexure. Operation. Panhysterectomy. Result. Well up to 10-3-11, when she noticed hemorrhape from the bowels. Duel Irom.

terectomy Result. Well up to 10-3-11, when she notled haemorrhage from the bowels. Duel from general carcinomatous metastasis. Had passed hive-year period when recurrence occutred. No 1954. Case 8 10-8-06 52 years, married 12 years 3 para, Irregular bleeding lor nine months. Vaginal discharge for one year Pro-

months Vaginal discharge for one year Frolonged periods Eramusalism. Cervax intact, uterus enlarged, freely movable Curettage shows, carrimona of fundus Operation. Panhysterectomy. No involvement of lymph glands. Result Recovery before she left warf Patient well and domg heavy work to—t—ti, when there was a recuttence Ded from suppression of unne Had just passed five-

year limit when recurrence occurred
No 1433 Case 9 1-11-05. 31 years, mar-

tied is years 2 para Vagual breeding for three weeks, with chile Examination Choros-publishma of uterus Relaxed vagual outlet. Cervus soft, uterus enlarged Operation, Panhysteroctomy Consulexeuse Dyspacas, pan in chest with cough Physical signs in chest negative Rusty sputum, cardisc murmur over apex Result Died within week after operation Post-

sult Died within week after operation Postmortem examination showed general metastasis No 2189 Case 10 7-3-07 40 years, single. Examination. Myoma uteri with cancer of fundus. Operation. Partial hysterectomy Impossible to remove cancerous metastasis Result Died 7

months later, continuation of disease

No 2083 Case 11 6-13-00 55 years, marred 14 years 3 para. More or less constant bleednen for a year Exommoduon Extensive cancer of
lundus. Metastasis to broad ligaments. Operation Abdommal hysterectomy Wide excision of
parametrum but cancerous tissue appeared to have
passed beyond border lines of operation. Result.
Patient died 10-26-10 General metastasus, Extensive local recurrence Severe pain Cystitis,

Suppression of unne.

No 3111 Case 12. 11-23-09 40 years, marned 20 years, 1 para Irregular bemorrhage for
one year Cramp-like pains relevable to gall-stones,
Examination Carcinoma of fundus with slight
cancetous juvodvenent of vagina Operation, Hysterectomy. Only slight area of cancer in fundus,
Result 4-3-5-12 Well, examination shows no

evidence of recurrence

No 3144. Caser 3 12-16-09 55ycars, single Vellow leucorrine a uth profuse uterine harmorrhage. Marked loss in weight in last year Constant backache, epigastine pain Examination. Carcinoma of fundus Operation Panhysterectomy; dislatation and curetings showed large piece of finable material Convolucion. 5-t-17 patient died of acute cerebrospinal meningitis. Autopsy revealed no microscopic trace of cancer.

THE RADICAL OPERATION FOR CANCER OF THE UTERUS

BY THOMAS S CULLEN, M. B., BALTIMORE

"HE early recognition in recent years of cancer of the body of the uterus, and, as a consequence, the complete removal of the uterus, has led to such excellent temporary as well as permanent results that a consideration of this variety of cancer of the uterus is at this time entirely unnecessary. Some operators claim that nearly all of these patients are permanently cured of their cancer, and a most conservative estimate would be that fully two thirds of all cases of cancer of the body of the uterus operated upon never show any further manifestation of the disease This fact is often lost sight of in the gloomy reports frequently published on the final results in cancer of the uterus. The diagnosis in the majority of the

cases of cancer of the body of the uterus has been made from scrapings, and from them the diagnosis is rendered certain in the incipient stage of the disease. In no other branch of surgery has the value of the microscope as an aid to the surgeon been more signally demonstrated. In the present address, therefore, I shall limit myself to a consideration of cancer affecting the cervix.

CANCER OF THE CERVIX

Before considering the immediate and end results in the radical operation for cancer of the cervix, permit me to outline the salient points in our operative treatment of these cases.

Operability It is very difficult to ascertain the percentage of cases that are suitable

1 Read before the Third Chaical Congress of Surgeons of North America. New York City, November 14, 1912

for operation. Many patients never see a physician until the disease is too far advanced for any radical operation, and often it happens that the surgeon is not even called upon to see the patient. Again, as pointed out very clearly by Taylor, numerous far advanced cases of caner of the cervix are seen in the dispensaries, and only a minority of these reach the operating room.

When the cervix is freely movable, we consider the case operable; and although the growth may have extended to the vaginal wall, and even if the broad figament on one side shows diminished mobility, provided the patient is in a fair physical condition, the abominal operation is considered justifiable.

Before declining to operate, it is, as a rule, advisable to examine the patient under an anarsthetic, as one is occasionally able to detect that the lateral thickening is due, not to an extension of the cancer, but to a coincident inflammation of the tube and ovary. This we have noted on several occasions, and Taylor has recently drawn attention to this point

TECHNIQUE OF THE OPERATION

I have never performed a vaginal hysterectomy for cancer of the cervix, but would not hesitate to do so were I dealing with a very stout patient suffering from a carcinoma of

the cervix, associated with marked prolansus. Preparatory treatment of the cervix some of the cases, we have cauterized the cervix thoroughly and then abstained from all local treatment for a week, thus giving the raw area a chance to contract down. In some instances, this procedure has been followed by a marked "loosening up" of the cervix, and the uterus, which, prior to the cauterization had apparently been somewhat fixed, in the course of a few days had become freely mov-On the other hand, I have noted that some patients take a second anæsthetic within seven or eight days very badly, and so much have I been impressed with this fact that for several years I have, whenever possible, done the cauterization only just prior to opening the abdomen

My colleagues at the Johns Hopkins Hospital, at the present time, after cauterizing the cervix and washing out the vagina, flush it out with an iodine and alcohol solution (jodine 3.5 per cent). When this is removed, the vagina is failed with alcohol. After this in turn has been removed, the vagina is thoroughly dried and is then failed with gauze. This method has proved to be most satisfactory.

ABDOMINAL HYSTERECTOMY

The operation is patterned after that described by Wertheim. Good exposure of the field of operation is absolutely necessary to secure a thorough removal of the diseased structures. When the patient is very stout, a transverse wedge of skin and fat down to the fascia may be removed, and the abdomen then entered through a longitudinal incision. This procedure greatly reduces the depth from the surface to the floor of the pelvis, and materally cuts down the time consumed in the

operation
In quite a number of the cases, we have employed an electrically heated table throughout the operation, and it has seemed to me that these patients left the table in a much better condition than the average patient after hysterectomy for cancer

Proper illumination is of great importance in this operation, and we have found the Kronig light of much value in flooding the field of operation with a steady and most satisfactory flow of artificial sunshine. This light is a great adjunct to any operating

As many of the patients are weakened by the long standing hemorrhage and discharge, I try to save the strength as much as possible by not placing the woman in the Trendelenburg posture until the pelvis has been carefully walked off and the operator is ready to expose the uncters

As a rule, I have found no difficulty in locating and isolating the ureters except in very stout persons. Here the peritoneum appears to be excessively thin, while the underlying fat is correspondingly thick, and the small blood-exsels in the fat tear on the slightest traction. When the patient is thin, I rarely encounter much trouble until the vaginal veries to the outer side of and below the ureter are reached. These are usually readily controlled with the long Wertheim forceps, but

now and then give rise to alarming bleeding. Occasionally, prior to cutting across the vagina, I apply the right-angle Wertheim clamps, but usually, after doubly walling off the uterus from the pelvic wall, and having had an assistant wipe out the vagina until the pledgets come away free from stain, I cut across the vagina, picking up the vaginal margins with Ochsner clamps.

After all ozzing from the vaginal margins has been controlled the bladder peritome is tacked to the edge of the mucosa of the anterior vaginal wall. Thus, as the bladder distinct, at the peritoneally covered area that ascends, and no raw surface is left to ride over any drain that may be left.

In some of the cases I have removed the

pelvic glands, in others I have not disturbed them. Many of my patients were much exhausted by the operation, and I felt that any further time expended in manipulation in the abdomen would seriously jeopardize the patient's life. In 1900, in my book on cancer of the uterus, I drew attention to the fact that an enlarged gland did not necessarily indicate cancer, inasmuch as the enlargement might be due to septic absorption from the cervix Peterson, in his series, removed the glands in 20 cases, and in 5 of these found metastases. Of the 5 patients, one died after operation, 3 had a recurrence, and one was well after 3 years Whether the glands are to be removed or not must depend on the condition of the patient, and must be left to the judgment of the individual operator

Closure of the petris. After the bladder has been attached to the amerior vaginal wall and the posterior vaginal wall to the rectum, the broad ligaments are closed. If all oozing has been completely checked, a small cigarette drain is laid in the petvis and brought out through the vaginal opening, which is now not over 1.5 cm in diameter. Where there is a little oozing in one or both broad ligaments, I have occasionally placed a cigarette drain in the lower angle of each broad ligament, bringing the ends out into the vagina.

Duration of the operation. When the carcinoma of the cervix is in an early stage, the patient is not likely to have lost much blood, and, as little sloughing has occurred, there

has been a minimal amount of septic absorption. In such cases the operation is a relatively easy one. In the far advanced cases the patient is frequently cachectic as a result of the anamia and the absorption of septic products. In these cases the growth often extends alarmingly close to the ureter, and as a result the dissection is slow. This prolongation of the operation in a patient already greatly weakened by the disease often leads to an alarming collapse before the operation is completed. Such a patient will stand the operation relatively well for from one to one and a half hours, and then suddenly collapse. A Wertheim operation, at best, is one of the most difficult of all the abdominal procedures, consequently the operator needs to be in the best possible physical condition. He should make it his first operation of the day, and preferably perform it early in the morning, when he is fresh Stimulation of the patient should be undertaken, even before there are the slightest signs of collapse.

When the cervix has been torn across during removal of the uterus, thus materially increasing the danger of peritonitis, I occasionally place an abdominal drain in the lower angle of the incision, in addition to the one emerging from the vagina. In these cases we place the patient in the Fowler position mmediately after the operation, if the pulse will remove the control of the pulse will remove the pulse will re

will permit

RESULTS IN THE RADICAL ABDOMINAL OPERA-TION FOR CANCER OF THE CERVIN

When the Committee of the American Gyuecological Society met in Baltimore to arrange the program for its annual meeting, which was held in May of this year it was unanimously agreed that the time had arrived when we should take stock of the results of abdominal hysterectomics for cancer of the cervix in America. The results of some of these labors are to be found in Surgery, Gunzcology AND OBSTETICS for August, 1912. That number of the journal includes interesting articles by Peterson, Taylor, and Taussig.¹ At the meeting, Graves for, and Taussig.¹ At the meeting, Graves

^a Dr John G Clark of Philadelphia Dr J Sampson of Albany, and several others also briefly reported their results in the radical operation Dr Clark a paper appears on p 255 of this issue, Dr Sampson's on Dr Sampson's on p

reported the results of his work in Boston and Peterson gave his statistics from Ann Arbor, Taylor sent out circular letters to about 175 operators in New York, Brooklyn, and Philadelphia. In his paper he 215, "The replies which I received did not give me any information along the line that I wished, and I have not been able to deduce from them anything of value as to the ultimate result of cancer operations in three two states." He learned, however, two things, first, the entire absence of reliable statistics among the operators, second, the universal feeling among the surgeons that the patients were not seen early enough to be permanently releved

Taylor then reports his own results. His immediate mortality was only 3 in 28 cases. Unfortunately many of his patients were lost track of, so that he could not determine the relative percentage of permanent recovery.

Taussig communicated with surgeons west of the Mississippi River. In all, he collected records of to patients, only 14 of these operations dated beyond the five-year limit. He says. "By a strange confedence, there was not a single operative mortality among these first 14 patients. Apparently, each operator was particularly careful in the selection of hirst cases." Of the 14 patients, one could not be traced and one had died of an intercurrent disease. Of the remaining 12 patients, 5, or 41 o per cent of these, were still free from recurrence. This is an exceptional tygood showing, even though the numbers be

small Neel 1 after much labor, was able to trace the records of the cancer cases operated on by the radical method at the Johns Hopkins Hospital. These operations were performed by Dr. Kelly and his associates, and by the residents during the various years reported, in all, seventy cases in which over five years had clapsed since the radical operation had been performed. There was an immediate mortality of 20, or 28 6 per cent. Of the so patients leaving the hospital, nine had been lost track of, and one had died two years later of pneumonia, 14, or 20 per cent of the total number of patients, are to-day free from recurrence, and the remainder had died with

unmistakable cyidence of return of the growth. Neel draws attention to the Jact that, if we deduct the 20 that died immediately and discard the patient dying of an intercurrent affection, and also subtract the nine cases that were lost track of, he still has 40 patients that survived the operation, and concrining whom he has definite data. Fourteen, or 35 per cent of the 40 patients, are still alive

At the request of the Committee of the American Gynecological Society, I was asked to find out to what extent the radical abdominal operation was employed for carcinoma of the cervix in the Southern states. Letters were sent out to most of the surgeons in the South, and I take this opportunity of thanking the many who took the time and trouble to reply The majority had never done a Wertheim operation, a few had performed it two or three times, and had lost sight of the patient. Only in a few instances were the statistics of any value to us, either because the operation was of such recent date or because the nation tould not be traced.

Under date of April 6, 1912, Dr. George Tully Vaughan of Washington writes. "In reply to your letter asking for data of Weethem of other abdominal hysterectomies for cancer of the certiv. I should say that I have not had a large experience in genecological worl. About twe complete abdominal operations for cancer are all I can muster — one death and the others still hving, so far as I know. One, at least, was heard from recent-

by three years after the operation."

Dr. H. H. Grant of Louis ille, Kentucky, replying under date of April o, 1912, 5398:

"I have done but seven panhystereonies for carcinoma, and but two of these included exploration for intra-abdominal glands, none claiming to be Wertheim. There was no immediate mortality. Two of these patients were subjected to amputation of the cervix, because of doubt, and in one, Mrs. L., aged 37 years, reoperation was done after three months for a threatening recurrence in 1900. She died of recurrence ten months after the second operation. The other, aged 41, was reconcarted on in three weeks. She died in

five months, of recurrence The other five

" I'm Neel a paper appears in this fause of p ago

cases are still living. Mrs. W., aged 54, operated on November, 1909, well; Mrs. H., aged 47, operated on in February, 1910, well; Mrs. M., aged 51, operated on in April, 1911, well; Mrs. C., aged 42, operated on in March, 1910, suspicious; Mrs. M., aged 48, operated on in December, 1911, well.

Dr. J. Mason Hundley of the University of Maryland has had quite a number of permanent cures, and is a most enthusiastic advocate of the radical operation. Under date of November 1, 1912, he writes: "I find we have records of 21 radical operations for earce of the cervix done by me since 1905. Of that number, 2 died as a result of the operation and one died after reaching home. Four zer living and apparently well: one operated upon about six years 250, three between seven and eight years; and one is now dying, operated upon there years 250. Three are living after two years. The remainder have been lost track of."

At the meeting of the American Gynecological Society, I reported my results in 49
cases in which a complete abdominal hysterectomy was attempted. As noted from the
accompanying table, brought up to June 1,
1912, there were 11 immediate deaths, a mortality of 23 par cent, 3 patients were lost
track of, and are accordingly included among
the dead; 21 died at periods varying from a
few months to six years. Fourteen were living and apparently well at the time of the
meeting.

Some of the deaths were due to uncontrollable venous cozing, others to shock due to harmorrhage or to the greatly weakened condition of the patient, others to renal complications, and, in a few instances, to a localized purulent peritonitis. In the tabulation of temote deaths, it will be noted that in some it was clearly evident at the time of operation that the entire growth had not been removed. The death in nearly all of these cases was due to a continued progress of the disease

Fire-year limit. Twenty-six of my cases were operated on over five years ago. Of this number, seven died while the patient was still in the hospital. One of the patients was lost track of. Eleven died at periods varying from a few months to six years, and seven, or 26, per cent, are well lo-day.

z is well 654 years after operation.

r is well 8 years and 4 months after operation.
r is well 8 years and 6 months after operation.
r is well 9 years and 8 months after operation

1 is well 9 years and 10 months after operation.

1 is well 13 years after operation.

In three of these cases, the ureters were catheterized prior to opening the abdomen.

The cancer in four of these successful cases

The cancer in four of these successful cases was apparently confined to the cervix, the uterus being freely movable. In one case, the growth had extended into the right broad ligament and encroached alarmingly on the ureter.

In one case, the carcinoma had made such extensive inroads on the anterior wall of the cervix that the bladder had become densely adherent to it, and was opened during the dissection.

In the remaining case, the cervix was so extensively involved that, during the operation, the body was almost completely ton away from the cervix, and on examination of the specimen after removal, the careinoma was found to have extended almost to the cut surface. In this case a most guarded prognosis was given. It is now over eight years and six months since this uterus was removed, I need hardly add that in every case a histological examination was made.

RESULTS OF ABDOMINAL OPERATIONS FOR CANCER OF THE CERVIX 1

Jamedatt deal), 11 date 11 Hz.

Ruchardom, Ayrd, 100
Tate, July, 100 (II).
Kyle, October, 1000 (II).
Kyle, October, 1000 (II).
Compton, April, 1003
Rogers, Jairce, 100
Vogelsang, November, 1006
Vogelsang, November, 1006
Ilavatter, August, 1000
Rang, December, 1009 (II)
Harris, November, 1000 (II).
Harris, November, 1000 (II).
Nai located, 3 cater—Collins, January, 1008
Welch, January, 1008 (II).
Patienti Hung, 14 cater—Ilavation, 1000
Ryan, June, 1901; 11 months (II).
Carrioll, May, 1011, 12 months (II).

Patients String, 14 caser —

Ryan, June, 1901; 11 months (II).
Carroll, May, 1911, 12 months (II).
Gnifith, October, 1910; 18 months
Lucas, November, 1909; 2 years, 5 months (II)
Hellman, December, 1908, 3 years, 6 months (II).
Sangwin, May, 1909; 3 years, 6 months

¹ Those marked with (H) I performed at the Johns Hopkins Hospital, the others were dose at the other hospitals with which I am connected. Conklin, June, 1908, 3 years, 8 months (It). Humphreys, December, 1905 Herzen, April, 1904; 8 years Yerkes, January, 1904 Brown, August, 1903, 8 years, 6 months

Wotfen, August, 1902, o years, 8 months Mrs. M., patient of Dr. Geo. H. Carveth, Toronto, December, 1902, 9 years, 19 months

Ketler, June, 1899, 13 years Remote death, 21 cases White, April, 1903, partially removed Tolley, April, 1903, partially removed

Howen, November, 1911, 2 months, uremia, blindness Olfers, April, 1908, recurrence, 3 months (11)

Jones, 1910, ched, 6 months (II) Bozeman, December, 1910, incomplete removal. Died, 6 months

Smyely, June, 1910, thed, 6 months Finkle, April, 1903, died, 3 months

Porter, January, 1905, not entirely removed, died, 11 months

Karr, July 1906, died, 14 months (II) Frinklin, February, 1908, died, 16 months (II) Willis, October, 1902, died, 18 months (II) Mack, February, 1908, died 19 months (II) Raymond, January, 1905, new 19 months (tt) Lerguson, September, 1905, died, 21 months (tt) Treps, January, 1905, in ed 2 years Baldwan, May, 1905, he ed 3 years, 10 months (tt)

Stehle, May, 1904, lived 4 years Riggins, January, 1905, lived 5 3 cars Mengel, May, 1904, lived nearly 6 years Operated on over 5 years ago, 26 cases -

tmmeliate death, 7 cases Not located, 1 case Remote deaths at periods varying from a few months

to nearly 6 years, 11 cases PROGNOSIS

7 cases or a6 9 per cent

Even after removal of the uterus, it is very difficult to give a satisfactory forecast as to the ultimate result Sometimes a case that seems most favorable shows an early recurrence, while a border-line case that looks most unfavorable may remain free of the disease. When the growth of the cervix is of a glandular type, however, we may look for a speedy

return An early local return, while most disconcerting, need not necessarily prove fatal. Nearly two years ago, a very competent surgeon in a Southern state did a radical operation, and within a few months a carcinomatous nodule was detected in the vault. In this case, on account of the proximity of the carcinoma to the ureter, I opened the abdomen and isolated the ureters and removed a long cuff of the vagina. This patient, up to the present time, ro months later, has had no further manifestation of the disease.

Temporary Relief. Some surgeons are of the opinion that, if the entire growth has not been removed, the patients suffer much more than if no radical operation has been performed. In my experience, the patient in the late stages is no more prone to pressure symptoms than is the woman who has not been operated upon. On the other hand, frequently the growth spreads in such a manner that the vaginal mucosa is not again involved, and the patient is accordingly spared the frequent hamorrhages and the foul-smelling discharge I am frank to admit that in some cases I would have refraired from operating had I been aware of the widespread extension of the disease, but sometimes, when tihe growth is not very dense, the extent is only ascertainable when the operator has partially completed his dissection, and complete removal of the uterus cannot then be avoided

DEDUCTIONS

It is difficult to lay down a hard and fast rule as to what cases should and what cases should not be operated upon. All familiar with the course of this dread disease know that in time the hemorrhages become very severe, and that later on, in the intervals between hamorrhages, the patient has a most foul and loath-ome discharge, and that in some cases rectovaginal or vesicovaginal fistulæ or both may develop They also know that the patient becomes a burden to herself and a source of the greatest anxiety to her family, who are powerless to do anything, and finally, that most painful pressure symptoms may develop With such an outlook. I feel sure that there is not a man in this audience who, if brought face to face with such a problem in his own family, would not gladly take the chance of an operation, if there were only one or two chances in a hundred, as a matter of fact the chances are infinitely better

Over a decade ago, when speaking before the Academy of Medicine in this city on the early diagnosis of cancer of the uterus, one of the most distinguished gynecologists of New York, in the discussion, said, if I remember correctly, that he had operated on over 120 cases of carcinoma of the uterus, and that at the time of the meeting not one of them was

living. The splendid results obtained by Wertheim and others in Europe leave no doubt that great strides have been made in the cure of cancer of the uterus, and even from the limited observations in America, it is clear that considerable progress has been made, and there is no reason why we should not materially increase our percentage of perma-The Germans certainly have one nent cures advantage over the American surgeons Many of their patients have had large numbers of children and, owing to their manner of work, have not accumulated the large amount of adinose tissue that is so prevalent with us. Consequently the continental operator can at once secure a much better exposure, and is not troubled with the abundance of adipose tissue around the ureter and in the broad ligament.

The oftener the surgeon performs this operation, the more expert he becomes. the length of the operation is shortened, and consequently the death rate is lowered. The German surgeons apparently see many more of these cases than surgeons in this country During my last trip to Germany, I was making rounds with Professor Zwelfel, in Leipzig. and he told me that in one month he had performed fifteen Wertheim operations for cancer of the cervix It is, therefore, only natural that the German surgeon should have a lower operative mortality. Again, the continental surgeon bas materially profited by the widespread publicity which the cancer problem has received, both in the profession and among the laity

From time to time attempts have been made in America to start an education of the women of this country to the necessity of reporting any suspicious symptoms at once to their physicians, but, apart from some spasmodic efforts, nothing has really been accomplished. It would be most fitting if this splendid society should here and now start a cancer campaign that would extend from coast to coast. It can and should be undertaken at once. Publications that have done much to enlighten the laity on medical matters could

be of invaluable service in the dissemination of this knowledge.

The laity now have a clear idea of the subject of appendicitis, and whereas a decade ago it was often necessary for the family physician, after making the diagnosis, to spend hours in urging the necessity for immediate operation, at the present day, after has given his verdict, the first question asked by the family is, to what hospital the patient should be sent.

The splendid crusade against tuberculosis is another example of the immense amount that has been accomplished by the education of the rank and file of the community.

Two or three well-illustrated articles, explaining in simple words just what cancer is, how it spreads, and what may be accomplished by early operative interference, will be all that is necessary to put women on their Many of them have an innate fear that they will some time develop cancer of the uterus, and are fully aware of the distressing train of symptoms in the advanced stages of this dread disease What we want to do is to impress upon them the fact that any abnormal bleeding, no matter how slight, should be immediately investigated by their physician to ascertain if cancer be present. If no malignancy be found, they are relieved of their unnecessary anxiety. If cancer be present, it can be combated in the early stages. The fact that early cancer may be successfully eradicated by operation, and that it is in the beginning a strictly local process instead of a "general blood disease," as it is so often referred to by the laity, should be most forcibly impressed upon the community.

The sooner this subject is launched the sooner will our percentage of permanent cures increase. I feel sure that after women in general are thoroughly familiar with the necessity of an examination just as soon as they present any symptoms, the surgeon will be able to save, at a conservative estimate, from 20 to 25 per cent of these cases.

Among the most important surgical papers that emanate from the larger clinics are those which deal with the after results in various operative procedures, and it is well worth the while of every surgeon to "take stock" at regular intervals. Having a vivid recollection of the numerous immediate deaths I had encountered following the Wertheim operation, I hesitated long before I could make up my mind to attempt to locate the patients that had left the hospital. But when, finally, the work was commenced, and it was found that some patients had enjoyed comparative comfort for one, two or three, or even six years, I felt that the operation had been worth while. And when seven letters came back saying that the patients were well at periods varying from six to thirteen years, and expressing the most profound thanks for what had been done for them, I could not help feeling that the radical abdominal operation is the one destined to yield the best results

This is an operation, however, that cannot be lightly undertaken, as it requires the very best efforts of the surgeon My friend, Reuben Peterson, has expressed my sentiments so well that in conclusion I will quote what he has recently said on the subject.

"My belief in this operation has only become stronger. However, the experience afforded by eleven additional cases has not made me any more confident that the next patient I operate upon will either survive the primary operation or will ultimately be cured. On the contrary, in contrast with other abdominal operations, the more I perform this operation the more I respect and, possibly, dread it. Yet I adhere to it for the simple reason that, in my hands, all other operations for cancer of the uterus have been disappointing in their uniformly bad ultimate result, while with the radical abdominal technique I I have been able to save a fairly good percentage of my patients, and that, after all is said, is what the surgeon is after. If he be not content to set at naught his surgical reputation as far as primary results are concerned for the sake of ultimately curing more patients, he would best not meddle with this operation, which, in apparently favorable cases, is only too ant to turn out to be grave "

THE CAUTERY IN THE RADICAL TREATMENT OF CANCER OF THE CERVIX'

BY X O WERDER, M D, Pritsochen

THE cautery, at least at the present time, is not generally associated with the radical operation of this condition, but is considered a very useful and important aid in the palliative treatment of cases of cancer which have reached the inoperable stage, and consequently, with its use we do not expect a cure, but merely a relief of symptoms and a temporary check to the advance of the neoplasm But it is within the recollection of many of us here present when the cautery. either in the form of the galvanic loop or the cautery knife and dome, gave results which excelled all other methods of treatment then I need only refer to some of our own countrymen, such as Baker, of Boston, and Reamy, of Cincinnati, who, by a high amputation of the cervix by means of the

hot platinum loop, succeeded in permanently curing a large percentage of early carcinomata of the cervix The most remarkable record, however, was unquestionably obtained by Byrne, of Brooklyn, partly because of the great number of cases treated by him, as well as the wonderful results obtained by a minor operation without a single operative death In the 367 cases treated by him during twenty years, he had nineteen per cent living five years after operation-this in spite of the fact, as I have been reliably informed by some of his colleagues and pupils, that he made no selection of his cases, but operated on practically all coming under his care, no matter how extensive and hopeless the neoplasm was found to be This successful experience in the use of the cautery was

1 Read before the Third Chincal Congress of Surgeons of North America, New York City, November 14, 4912

not confined to these few men, but many others in Europe had similar results, especially Carl Braun, of Vienna. Even Schroeder, who was not an advocate of the cautery, but used it only in the advanced cases, was surprised at several unexpected cures, in apparently hopeless cases, by this means.

It may well he asked why such favorable results in advanced cases of carcinoma of the cervit are so extremely rare now, though the cautery is still in common use in inoperable cases. Do we use the same technique and methods so successful in the hands of Baker, Byrne, and others? Baker's states that it is of the greatest importance not only to apply the cautery very thoroughly and over a considerable length of time, but also to keep these cases under observation, to excise any suspicious tissues promptly and again cauterize very thoroughly. After two or three such applications he has succeeded in getting some of his best results

Byrnes also strongly emphasizes the importance of very thorough cauterization, no matter by what means the growth may have been removed He also wishes to impress the patient with a sense of the vital necessity of frequent examinations after any operation. I am afraid there are few of us who carry out the instructions of these old masters, particularly with reference to repeated cauterizations. We are all inclined to be too pessimistic in dealing with these advanced cases. We lack interest in these inoperable cases, because we consider them doomed from the outset, and think our duty fully performed by giving them the henefit of one thorough canterization. We are then only too ready to dismiss them from our observation and leave them to their sad fate, without any encouragement to return for further treatment With greater patience and perseverance and more confidence in the cautery we might be more successful in prolonging these unfortunates' lives, and, possibly, even occasionally obtain a cure

What impressed me as the most remarkable feature of the Byrne operation, especially when

compared with all other ordinary vaginal operations for cancer of the cervix, was the almost uniform absence of local recurrences. Byrne3 says: "I have never known an instance of relapse in which the disease had returned in the part from which it had been originally excised. I have repeatedly observed the reappearance of the disease in the fundus. ovaries, or some adjacent tissues, but I have never known a single instance in which the disease has reappeared on or close to the cauterized surface from which the cervix had been removed by galvano-cautery." He explains this by stating that "there is hardly any doubt that the developmental activity of the cancer cells or germs in certain stages, and under certain conditions, may be arrested or permanently destroyed by a degree of heat much below that which would be detrimental if not destructive to normal tissues." He is certain that the thermal agent exerts some modifying influence on the pathological processes much beyond and deeper than the surfaces actually cauterized. hence the importance of repeated applications, so that "every spot suspected of contamination may be thoroughly charred." He regards the black and charred wound cavity as "the best safeguard against the recurrence of the disease" The local mechanical effect of the cautery, consisting in directly destroying the cancer cells and by producing coagulation and necrosis, preventing a direct implantation into healthy adjacent tissues, seems to me scarcely a sufficient explanation of the evidently deep destructive action on the cancer tissues not in close contact with the heated instruments. It seems to me to justify the assumption that some chemical action is produced, some toxins, perhaps, which penetrate the deeper structures, and while not seriously damaging the normal cells, inflict permanent injury to the less resistant cancer cells

For this work I have used both the Paquelin and galvano-cautery, but I consider the latter much preferable and more effective. In my experience, it is more difficult to get a thoroughly charred and an absolutely dry and black surface with the Paquelin than with

Trans. Am Cynec, Soc . 1883. p. 183

[&]quot;Zur Frage der Heilbatkeit des Caramoma," R. Lomer in Zischr I Gebortab u Gyralk, Ed L "Theatty Yearn Experience in the Treatment of Cancer with Gal vano Cautery." Am J Obst., N Y 1859

the properly constructed dome-shaped galvano-cautery.

The excellent results obtained in these minor operations for cancer of the cervix by the galvano-cautery in the hands of Byrne, and others, impressed the writer to such a degree that he was induced, almost eight years ago, to employ it in the total extirpation of the uterus for this disease be permitted a little digression and a personal explanation in this connection, I will briefly refer to an operation which I had been doing up to this time (eight years ago), and which is still spoken of as the "Werder operation" in some of our American and English books on gynecology The technique of this operation was practically the same in every detail as that described for the first time two years later, hy Wertheim, in the Archiv fur Gunakologie When I called Wertheim's attention to my description of the same operation, he frankly admitted my claims to priority in a personal letter to me and practically did the same in a communication to the Archio fur Gynakologie, Bd 62. Since that time Wertheim has materially changed and improved the technique of the operation in so many respects, that I feel he is justly entitled to all the credit of the operation now generally known under the name of "Wertheim," all the more so since I have abandoned it for the cautery, for the reason that its mortality seemed too high, at least in my hands, and scarcely offset the cain in permanent cures resulting from it, and because I saw in the eautery a safer and, possibly, just as effective a means to successfully combat this discase

The technique of the eautery operation since I first tried it has undergone many changes, but the principal feature, complete ignie-ettipation by means of the galvaneocautery knife and Downes' electro-thermac clamps, has always been retained. The first nineteen operations were completed entirely through the vagina, assisted often by the Schuchardt incision, but since then I have adouted a combined operation, beginning in

the vagina and completing it by the suprapubic route. The difficulty of protecting the adjacent parts sufficiently, especially the ureters, during the application of Downes' heated clamps on the broad ligaments through the vagina, and the impossibility, at times, of deciding whether the case be a suitable one for radical treatment without abdominal exploration, induced me to adopt this change of technique.

The operation is preceded by a thorough curettement of the diseased surfaces, and cauterization until all oozing is controlled The eervix is then firmly held by volsella forceps and an incision is made entirely around the eervix, as far as possible from the affected area, by means of the cautery knife, kept at a dull heat, to prevent oozing and rendering the wound dry While making traction upon the cervix, the dissection is carried up carefully between the bladder and uterus, an assistant with a retractor drawing the bladder well away from the heated knife. until the peritoneum is reached, which is, however, not opened. Douglas' pouch is opened posteriorly by the same careful dissection, assisted by the index finger, and the lateral vaginal attachments are then burned through. The vaginal wound is now earefully inspected, and wherever the surfaces and edges do not look black and charred or show some oozing, they are gone over again. by means of a dome-shaped cautery, until they look perfectly dry and feathery The vaging is then tightly packed with gauze and the patient's abdomen prepared for lapa-

rotomy
A free incision is made between symphysis and umbilicus, and the uterus seized with a stout vubsellum forceps, after packing off the peritoneal cavity very carefully with gause pads The bladder peritoneum is incised from side to side, opening into the cavity previously made by dissecting off the bladder from the uterus through the vagina. A Downes' electro thermic clamp is then applied to the right infundibulopelvic ligament and round ligament, the surrounding parts being carefully protected by the shield and additional wet pads, the tissues included in the forceps are then thoroughly cooked

¹ Th's operation was described by me in the Am J Obst, N Y March 150% under the title of A New Operations for the Radent Testimon 150% under the title of A New Operations for the Radent Testimon 150% under the Radent Testimon 150% under the Radent Testimon of Radent Testimon 150% operation 150% under the New Radent I have gard with at the Person time. This natural having and well at the pressor time.

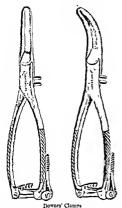
until a thin, white ribbon is obtained. The clamp is then removed and the ribbon cut through near its inner edge, and if, after a few minutes, no bleeding occurs, dropped The other side is then treated in exactly the same manner

This brings the operation down to the parametrium By passing two fingers of the left hand through the opened Douglas' pouch into the vagina and grasping the uterus hetween the two fingers, one on each side of the cervix, the uterus is firmly drawn up and its parametrium made tense and more easily accessible. This is then seized, first on the least affected side, in a clamp, after the blad der and ureter on that side have been carefully protected and is then burned through, the ribbon thus made is cut through, and then another portion of the broad bgament and sacro uterine ligament is burnt in the same manner, thus freeing one side of the uterus from all its attachments. It is then a comparatively easy matter to treat the opposite parametrium in exactly the same way our technique has been good, not a drop of blood is lost, and the surfaces are all perfectly dry If, however, we should find a bleeding noint, either the burning may be repeated, or. if one of the larger vessels is bleeding, a catgut ligature would be preferable With a little experience in this technique it will rarely be necessary to use any ligatures very important point is the thorough oiling of the inside plates of the clamps with sterile olive oil, the failure to do so will cause a baking of the tissues to the clamp which on opening will tear the ribbons and possibly bring on some bleeding I have never seen any bleeding follow from a well-formed ribbon.

The stump of the vagina is now exposed, its cauterized edges inverted downward and approximated with a continuous catgut suture Next the bladder is brought over the sutured stump of the vagina and its peritoneum stitched to the rectum posteriorly The broad ligament stumps are carefully covered up with peritoneum on hoth sides. just as after a typical panhysterectomy for fibroid tumor The abdomen is then closed without drainage. The abdominal part of the operation is practically that of an ordinary

panhysterectomy, with only this difference, that the broad ligaments and parametria are clamped and burned, instead of tied with heatures No preliminary dissection of the preters has thus far been made; for the exposure of the parametrium and for the protection of the preters we have depended on firm traction upon the uterus and the sides of the bladder with two fingers hooked through the opening in Douglas' pouch over the cervix while the clamps are placed in position. Only one injury to the ureters has occurred since doing the combined operation and that did not manifest itself until about ten days after operation When operating exclusively through the vagina there were two ureterovaginal fistulæ as a result of heat necrosis. one of these was subsequently cured by an implantation into the bladder by myself, the other case had the kidney removed by another surgeon In a few cases, however, I was obliged to expose the ureters freely down to their vesical insertion, enabling us to excise the parametrium more completely without fear of damage to these important struc-

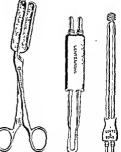
During the last year the procedure just described has been slightly modified, by first amputating the cervix by the cautery knife, doing a fairly high amputation, accompanied by thorough cauterisation of all parts until complete hamostasis is secured and a black, dry, charred wound surface presents itself everywhere in the roof of the vagina object of this is an endeavor to use more extensive and prolonged heat application to the vaginal surfaces, especially about the basis of the parametria, thus obtaining, in our opinion, a more complete and extensive destruction of the cancer elements in this particular field of operation. While this additional step takes up a little more time. it facilitates the subsequent intra-abdominal work considerably, especially in relation to the parametria. Another change is the use of ligatures for the infundibulopelvic and round ligaments, instead of the heated Downes' clamps, confining the application of the latter to the deeper structures in the pelvis, where cancer extension usually occurs, the upper portion of the broad ligament be-



coming rarely, if ever, involved in the operable forms of carcinoma of the cervix. As ligatures can be applied much more quickly than the heated clamps, considerable time is saved by this modification, without detracting in any way from the effectiveness of the operation

The regional glands in this operation, ex-

cepting in a few of the later cases in which enlarged glands could be distinctly outlined by the exploring fingers in the abdomen, have not been disturbed. While routine removal of the iliac glands is insisted upon by a large number of our modern operators, it is still an open question how much the patient gains by this additional tax on her vitality, and whether the results compensate her for the increased risk attending it. Wertheim's results, whose experience in this work has been larger than that of any other surgeon, have not been encouraging. Of the cases with multiple gland involvement they had only five



living at the end of five years undecided whether after all, there is not some truth in the suggestion made from different sources that the gland contains some elements not only able to resist cancerous invasion. but also under certain conditions destructive to the cancer cells On the other hand, by breaking into glandular structures and liberating the cancer elements, smearing them into the open connective tissues, as is unavoidable sometimes in their removal, we may be the means of laving the loundation for a subsequent cancerous infiltration in that region At the present time, therefore, I am, along with many other gynecologists, very skeptical in regard to the utility of the routine removal of regional glands, especially so, as I have seen in a number of recurrences glandular involvement in the upper part of the abdomen, belund the kidney, and in one case involvement of the mediastinal glands and those of the neck. These experiences prove beyond a doubt that to remove all the glands hable to become affected in this disease is a physical impossibility; to extirpate the few accessible ones only seems scarcely worth the additional risk.

During the period of almost eight years in which we have been doing this operation of have been operated by myself and my associate, Dr. Weiss. Only carcinoma of the cervix have been included in this number, for carcinoma of the corpus uteri either a panhysterectomy or a simple vaginal hysterectomy have given such satisfactory results that no change in treatment has been considered necessary or desirable. All cases of carcinoma of the cervix subjected to radical operations were treated by igni-extirpation during this period with exception of one, in which the uterus was extirpated without the cautery because an accident just previous to operation had put our electrical apparatus out of use for the time being In another case a high amputation of the cervix by the galvano-cautery according to Byrne method was made, on account of the age of the patient, who was 67 years old Neither of these two cases are included in this series of 78 cases In all these cases the clinical diag nosis decided the treatment, but this diagnosis was subsequently confirmed in every instance by the microscope. In none of these was it necessary to depend on a microscopical diagnosis, as the cases were all sufficiently advanced to be readily recognized clinically as carcinoma I mention this, not from lack of confidence in the pathological diagnosis. but because I consider a clinical diagnosis confirmed by the microscope as final and unquestioned Our average percentage of operability during the last fifteen years, during which I have been doing the more radical operation for cancer, has been 38 per cent some of these cases we started out with the expectation of doing a complete extirpation. but after curettement and cauterization we found the disease too far advanced to proceed any further, in several the operation was abandoned after an exploratory laparotomy.

igni-extirpation of the uterus, 78 cases in all

Four of the 78 cases died as a result of the operation One, who had nephritis at the time and previous to operation, died three weeks later from uramia. The second died six days after operation from a typical acute dilatation of the stomach The third one succumbed two hours after operation Irom shock It was a case with marked involvement of the iliac glands with deep infiltration

of the tissues and also extension to the bladder, which was badly torn during the enucleation. These complications, however, were not discovered until the operation was well under way, when it was too late to discontinue it The fourth and last death occurred two weeks after operation, in a woman quite anamic and enfeebled and in generally poor physical condition She left the table with a very weak pulse and we had great difficulty in getting her to rally. She developed a hypostatic pneumonia at the end of the first week, to which she finally succumbed. This makes a primary mortality of 5 1 per cent. which compares very favorably with that of any other operation for this condition

The most notable improvement in the operative mortality is unquestionably due to the absence of sepsis, not a single case has had any evidence of serious infection. In all my previous work in carcinoma of the cervix sepsis had been the cause of a large mortality The same is noticeable in the work of others Wertheim has an operative mortality of 93 in 500 cases, an average of a little over 18 per cent; of these almost half succumbed to septic complications. Schauta, who is an enthusiastic advocate of an extensive vaginal operation for cancer, has a mortality of 28 in 258 cases, or ro 8 per cent. Sixteen of these 28 deaths, or over half of them, were caused by septic conditions. The elimination of sepsis in our cases is not due to the preliminary curettement and cauterization of the diseased cervix, because that is done by Wertheim and Schauta, as well as practically all other operators, but must be attributed to the "cooking" process of the parametria, which, according to Liepman, is frequently the habitat of various pathogenic organisms in cancer of the cervix. the thermic action of the clamps these are not only destroyed in the field of operation. but no large, open wound spaces are left for absorption and further development. In all other operations, no matter by what method. it will be very difficult to eliminate entirely this great danger of infection. As there is practically no loss of blood in this operation the danger of heart shock (so common in the radical procedure) is greatly minimized.

No	Nami, Agi, Dati	Referred by Doctor	Operation,	Results			
1	Mrs L. 31. Dec 12, 1903	Stewart	Veginal tguesaturpation	Death after three weeks from uzema			
7	Mes V , 48, April 16 1904	Waude	Segroof igno-enterpation	Death after lour years from paresss. No recurrence			
3	Mrs M H 66, April 18, 1904	Boyce	Vaginal agus extirpation	Death efter four years from recurrence			
1	Mrs P M , 47. May 11 1904	II erder	Vaginif igni-entirpation	Living seven and one-half years. Had emputated of crewe for center our year before radical oper two was door			
ś	Mer H . 55 June 18 1964	Grahem	Vagnat upsi-enterpation	Death almost a year later from recultrance in inguing			
6	Mrs A Y . 55 July 7 2004	Shaelds	Vaginal sensentingation Implantation of lef- uriter min bladder about two years later (June a 1906)	Death from recurrence in glands after two and on belf years Left areter accuracy at operation R paned two years later			
,	Mrs C S 70, Stpt 8 6904	Gtube	Vegnal syn-exterpation	Death after sia years from other cause No recu			
8	Mrs E. 55 Oct 27 1904	Goulding	laginsi igni-erlapation	Laving seven years			
9	Mn R S 59	V erder	\aginal igne-estimation	Death after three years from recurrence in that region			
10	Mrs W 48 Jan to toos	Warnick	Vaginal igni-estirpation	Laving almost seven years			
ıı	Mrs K 36 Mat 6 tons	Wood.	Vagnal igni-extirpation	Death after five months from tecutionce to Vagina			
•	Mrs J H 35 Mat 8 1905	N erder	Combined igni-estispation Repair of tecto vag	Death affer three months from suppression of using Recto waginal facults			
13	Mrs W McC 38	Aldet	Vaginal igno-extingation	Death after thirn years from tecuprence in langua expron Site of operation effect			
14	Mrs. E. R., 40 April 26 1905	Matton	Veginal igni-titimation	Loving 61x 60d one half years			
1	Mrs LeC ga July g 1905	Deans	Vaposl igni-extirpation	Death after one yest from recurrence			
46	Mis M C 53 July 10 1905	Sayet	lagingli igno-extripation Recto-vaginal fixeds repaired two months later and again thirteen months later (Sept. 1905 and Oct. 1906)	Living aix and see-helf years Recto vagial facula			
67	Men J C 56 Oct 63 1905	Pollock	Variest igno-extrepation Estimpation of recur rest certinoma of vagina righteen months later (April 1907)	Death after fout 3 ears from recurrence to bladdet an vegina			
t S	Mrs M S 49. Oct 16 tp05	Lewis	Lagrani speciatorpation	Living sin years Venito vagioni Estula still preiett			
60	Mes H L 49 Dec 15 toos	Lewis	Combused vaginal and abdomesal igni-estimation	Death eftat two years from recurrence Right wrete severed at appration			
10	Mrs 2 F B 54 Dec 20 toos	Country	\ aginal igni-extifpation	Living 61x 5 ears			
11	Mrs J W 47 April 30 1906	Clark	Combard vegasi and abdomesal igno-exterpation	Drath from recurrence			
2.2	Mrs DFB 45 May 1906	Inch	Combined vaginal and abdominal igni-exterpation	Leving five years Health poor but there is be expleted of recurrence			
13	Mrs S F 33	Sturgeon	Combused vagual and abdominal igni-extripation	Living five and one half years			
74	Mrs 5 H gr June 18 1006	Miller	Vaginal agu-estrepation	Laving five and one half years			
5	Mrs J & 49, Sipt 13 1906	Wredze	Combined ignr-eximpation. Repair of vetaco var- ingle fields seven months later. Retipipentoscal cyst drained about three and one-half years later.	Living five years. Had vesko-vaginal bitula. Re- paired. Recurrence.			
10	Mrs G W 39 Sept 22, 1906	Somen ille	Combined ton-ext operion. Removal of fatty dibba- from abdominal wall tharteen months later (Oct 1001)	Breath eighteen months bilet from recuttrace to glands			
7	Mrs A P 35	Stanton	Combined vaginal and abdomainal agen-estaspolion	Death alter one year from recurrence in other parts			
28	Mrs J M . 30 Oct o 1000	Pridgeon	Combined vaginal and oldonismal tem-eartispation	Death after one year from recurrency			
10	Mrs W 5 36	McNalt	Combined veguals ad abdominal gravesticustion	Death efter five years from recurrence			

No Name, Age, Date Referred by			Operation	Results
30	Mrs F F J 47 Jan 30 1997	Jepson	Combined igni-extirpation	Vestco-waginal and rectovaginal fistules Death after two and a half years
31	Mrs J M 39 Feb 26 1907	Oliver	Combined spin-extinguision	Death after one and a half years cause not atated
37	Mrs P D . 47. April 9 1997	Burns	Combined and exterpation	Laving five and a half years. No signs of recuffence
33	Mrs + B 56 June 25 2907	Allmon	Combined gas-exterpation	Laving five and a half years. No recurrence
34	Virs C V 67 June 25 1907		Combined igni-extintation	Death two weeks after operation from acute dilata tion of stomach
35	Mrs O C 43 Aug 14 1907	Burchinel	Combined igni extirpation	Living and well after five years
36	Sept 24 1907	Emerling	\aginal ign-extripation	Living five years. No signs of recurrence
37		Shupe	\ aginal igni-extripation	Both ureters sloughed vesico-vaginal fistuli. Death from pneumonia one year later
3!	Mrs C L T 54 Dae g 1907	Tittle	Comprient states that some	Living five years Nil evidence of recurrence
3	Jan II Inch	Caldwell	Combined igni-extirpation	Death two years and probably from cancer

Accidents to ureters and bladder and other acidents to ureters are. I believe, with a little familiarity with the technique employed, no greater in the cautery operation than with other methods which strive to do a thorough radical extirpation of the uterus with a large portion of the parametria and upper portion of the vagina

As it would be impossible, in the limited time at my disposal, to discuss at length all the cases in this series, I will confine myself very briefly to those whose operation dates back five years or longer, because patients who have survived five years may as a rule be considered permanently cured. The percentage of such survivals is, therefore, a fair test of what an operation has been able to accomplish to save life We have fortunately been able to keep in touch with practically all our patients by receiving reports from them personally at irregular intervals, or through their physicians; I am, therefore, in a position to account for at least all the cases which come into this group In thirty-nine cases five years or more have clapsed since operation Twenty one of these were vaginal igni-extirpation and eighteen combined. Of these, eighteen have survived the five-year limit, or 46 per cent Five of these, however, have died since-one after six years from an intercurrent disease, and four from recurrence; one after six and a half years from carcinoma of the liver, one after six years from involvement of rettoperitoneal glands and spinal cord; one after five and a half years from recurrence in the lumbar glands, and one after five years, placeofrecurrence not known. That four deaths, 22 per cent, should have occurred more than five years after operation, when by a generally accepted rule the cancer victims should have reached the harbor of safety, is calculated to upset our present views concerning the prognosis of cancer operations, and would seem to necessitate an extension of the period of safety beyond five years.

Very little definite information can be obtained from a review of our statistics pertaining to such late recurrences, it is therefore not clear whether my experience has been exceptional and different from that of other operators, or whether less careful attention has been given patients who have passed the supposed danger limit. At any rate, such a large percentage of late recurrences should not fail to attract the attention of operators having a larger material at their disposal and lead them to make a thorough investigation of cases who have passed the supposed safety limit. Such an investigation would not only prove extremely interesting and instructive, but would be of considerable practical importance, as it would promptly solve the question which in view of my experience naturally presents itself, whether our views concerning the prognosis of our cancer patients have been too optimistic and whether we are still justified in considering five years sufficient to pronounce a patient cured. It may be objected that, as one of these patients died five years after operation, she should not be placed in this group, because while she was living after five years she was not well at this time, but suffering from a far advanced recurrence; even if a second patient, whose death occurred five and a half years after operation and whose condition of health may be considered doubtful at the five-year period, were excluded, it would still leave two nationts out of eighteen who certainly had no evidence of a return of the disease at this time, a sufficient percentage to justify a revision of our views hitherto held.

There are at present living and well thirteen cases, 3315 per cent, of these, three have lived eight years and more since the operation; three, seven years and more, two, oner six years, and five, five years and over. Nine of the survivals were cases of vaginal igni-extipation, and four combined. This leaves twenty-one cases whose death occurred within five years of operation, including the two

operative deaths

Of the nineteen patients who survived the operation twelve are known to have had a recurrence, the seat of recutrence being local in two, and in the inguinal, ilize and lumbar glands in ten Two deaths were due to intercutrent diseases and in five cases cause of death is unknown Death occurred within one year in seven, in two years in four, in three years in five, in four years in three-Eleven patients were less than forty years of age; of these only one is living at present. This seems to confirm the finding established by a number of experienced operators—that in carcinoma of the cervix, at least, age is of considerable importance from a prognostie l'atients who have passed point of view the menopause or are very close to that period are more favorable subjects for treatment than those during the height of their sexual activity. There seems to be no doubt that lymphatic extension occurs much earlier

and more rapidly in young patients than in the old, and this probably accounts for the difference in the prognosis.

A comparison of the permanent results in my cases with those of other operators shows unquestionably a very marked improvement over those obtained by all the older methods in which no special effort is made at resection or destruction of large portions of the parametria and the upper part of the vagina in proximity to the malignant neoplasm, with a primary mortality I believe considerably in favor of igni-extirpation. We have not, however, been able to reach the brilliant results reported by such men as Zweifel. Schauta and Wertheim, and other European surgeons. No American operators so far have equaled or even come near the percentage of cure- credited to these men, though many of them have been employing the same method, and operative technique. There can be only one explanation of this, which is that in this country the material reaching the surgeon gives less lavorable prognosis, because in the majority of cases the disease is further advanced, in fact has very often reached the border-line stage, where results must necessarily be more unfavorable, no

matter what method of treatment is adopted. Our urgent need is a systematic and energetie propaganda for the purpose of interesting the medical profession and instructing the American public in the canter problem in a manner similar to that carried on in Germany so successfully for many years, and which has borne fruit to such an extent that instead of having an operability of 38 per cent. as in my case, and even less in the hands of many other American operators, the operability in many sections of Germany and Austria has exceeded 60 per cent. We have reached a point in the treatment of uterine cancer when little more is to be expected in the technical improvement of our radical operations, as they have almost reached the limit of surgical skill; our only hope for further improvement in our results of the radical treatment of cancer is an earlier operation

DISCUSSION BY ROBERT L

T is most fitting and appropriate that this important paper on the cautery in the radical treatment of cancer of the cervix should be read in the eity that was the home of John Byrne by the man upon whom his mantle has fallen We pelvic surgeons of Brooklyn, who were taught by the genial gynecologist of St Mary's Hospital and follow in his steps, regret that we cannot show so long an array of eases as Pittsburgh boasts, but we, too, hold strongly to the faith that no other operation can compare with eautery hysterectomy from certain points of view, and, like Dr. Werder, are trying to perfect the methods of carrying out this mode of attack. It is possible that the reason removal by cautery fell into disuse was the mechanical difficulty connected with the battery of Byrne When it worked, it worked perfectly but it took the knowledge of a Palmer as assistant to get constant results in heating the knife All benzine-heated tips are clumsy and blunt No reliable method of heating a flat platinum blade has been available until the electric current, harnessed to such an outfit as I here show, gave us a delicately adjustable yet powerful effect There by the Byrne method comes into its own again, and we are able to drive home once



lig t. Specimen drawn immediately after removal, showing amount of broad ligaments readily removed with cautery knife

DICKINSON, M. D. BROOKLYN

more the axiom of our great Brooklynite with his unmatched results, namely, that the ideal treatment of the broad ligaments is sealing of their lymphatics by a "deep dry roast"

The second betterment that would tend to restore the operation of Byrne is the addition to his operation of a relatively wide dissection of the broad ligaments with the eautery knife of this I shall show you a five-year example on the screen (Fig. 1) Such broad ligament removal is adapted to cases of beginning or suspected infiltration of the broad ligaments. In general, however, the following statement applies

The theorem is susceptible of argument that most cases canable or canable by least operations. For such cases as I here show (Figs 3 and 4) where only a small area of crevity was affected the typical operation of Byrne has given 5) cars' immunity. The cervit with a small section of the vaginal wall has been



Fig 2 Operation of Byrne, showing, by the dolted lines, portions of uterus removed Applicable to very early cases only Drawn for Dr. Byrne by R. L. Dickinson



ig 3 Life size skeich of purtions of uterus removed in two steps at one session. The whole of the casety has been included. Drawn at once after removal. The year case

amputated in a cone shape the tip of the cone running up into the body of the uterus, as in Figs. 2 and 3 and ap to the very fundus, as in Figs. 3 and 4. Thereafter the lundus itself may or may not be taken out, as one chooses. I have removed the utrus, ovaties and

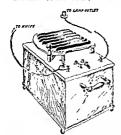
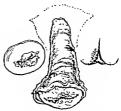


Fig. 5 Rotary converter used with Lidson direct continuous current. A sampler apparatus is employed with the alternaturg



hig 4 Life size sketch of section removed by cautery, the first portion including the whole of the ravity. Very early case. Drawn at once. The year freedom.

tubes, and considerable parametrium in one piece with the cautery without ligature save one strand on a large varicosity of the broad ligament, and without oozing But this is a surgical stant and not to be recommended If in an early case one degree to remove tubes and ovaries two figatures on each side are simide and sufficient and the abdominal wall need not be incised. I have had the pleasure of seeing Dr Werder do his orgeration in Pittsburgh but inasmuch as the parametrium presents the danger zone of extension in cervix cancer, it seems to me that if a vaginal attack has been undertaken the whole work had better be completed through the sagina. The purpose of the cautery is to seal the lymphatics. The lymphatic channels which carry dangerous cells are those of the broad ligaments and are sealed by Dr Werder in his vaginal work. The clamp on the ovarian and round ligament vessels of the upper third of the broad ligaments is, therefore, an unnecessary precau-

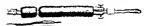


Fig 6 Heavy platinum knife which retain, its heat even in working in wet thours

tion against cancer located in the cervix and a considerable difficulty and complication His clamp follows the method of Downes Downes' clamp is a modification of the Skene camp, adding to the power and ecraseur action of the original instrument. Again, therefore, the operation advocated by Dr Werder is, in its second step, a modification of a Brooklyn manner of hysterectomy, that with electric hemostatic clamps.

Moreover, to really affect cancer statistics, an operation should be advocated which is within the reach of the surgeon and gynecologist of reasonable skill, because the more formidable operation cannot be undertaken by him And, lastly, consent to the vaginal operation may be obtained eather and more often than to the radical abdominal operation, for we are obliged to state to the patient that the attempt from above is one accommendation, for the particular than the contemps of the patient of the

panied by a high mortality We of the American Gynecological Club had the pleasure of seeing all the greatest operators of Germany, with one or two exceptions, do Wertheim operations, and I watched Dr. Wertheim carry out his own procedure more than once this summer It should be said with the strongest emphasis that the Wertheim operation is an operation to be done only by the most expert abdominal surgeons. because the wide dissection of the ureters and the very great difficulty in handling the veins deep in the lateral pelvic wall demands large experience and masterly skill and delicacy, and calls for a brillsant illumination deep in the pelvic cavern by the electric are beam, and even then the percentage of injuries to the ureter and the danger of peritonitis loom very

Earlier operation, vaginal operation, cautery operation—these are to my thinking, the direction of chief progress, over against the day of a successful serum, and even then the lesser operations will need to be combined with the far reaching injections.

The following data are added to make clear the discussion printed above

The apporatus comprises two electrical devices One is known as a rotary converter. This is used to transform the direct current into an alternating current. An alternating current may be trans-

formed far more easily than a direct current Therefore, the alternating current is used This alternating current from the rotary is in turn put through a closed circuit transformer. This closed circuit transformer stops down the voltage from that obtained from the rotary (about 75 volts) to about This 20 volt A C is obtained from the 20 volts secondary of the transformer, and may be regulated from o to 20 volts At the same time, in converting this higher voltage A C into a lower voltage A. C we are also transforming the quantity of electricity from a lower amperage to a correspondingly higher amperage output, so that one is able to obtain a lower voltage and higher amperage. This then is used for heating the cautery knives (Fig. 5)

Between the transformer and the kmit run particularly heavy cables, in order to lower resistance and to prevent beating. This applies especially to the wires running through the handle to the kmit This handle is very heavily insulated and does not heat up in a long operation. The absence of a switch in the handle seems to me also to make for lowered resistance and cooler structures, but some operators prefer such a switch in the handle.

The peculiarity of my knife, in which it differs from others, hes simply in its larger mass of metal. Thereby the lesser degree of heat is longer held, and thereby also in connective tissue planes the slightly curved blunt blade can push away structures like the bladder (Fig. 6).

The differences from previous apparatus, and practically the whole story of efficiency in this outfit, now about two years in use, depends on two things a powerful rotary converter and a powerful kmie connected by heavy wire Little knives and thin knives cool quickly, and, in consequence, the operator heats them far too hot, so that the tissues are charred instead of being cooked to horn black scab on the end of a vessel is knocked off by the blood current or the retractor. The tough, white stiff surface, feeling and looking like horn or rubber, is the tissue to leave in the track of the knife Thus he who has used the method a few times is not afraid to cook the uterine, and trust to the cooking to hold the vessel but the beginner will sleep better with ligatures about these big vessels

The outfit is made by the Wappler Electric Manufacturing Company, of New York. Steps of the operation Byrne worked with the

Steps of the operation Byrne worked with the patient in Sims' posture in order to secure a ballooned tagina and save anterior wall retraction. I prefer the dorsal posture because the anatomy of the broad higaments is more easily kept in mind.

Rotten ussue may be curretted from the cervus cavity and bothen or pure carbole acid is wabbed over the surface and the cervus closed by sutures or clamps. In early mole ment By me's method of camps, in early mole ment By me's method of the control of the value of the control of the control

wall. Where the disease is in the canal alone this is not essential and the dissection may begin near the cervico-vaginal junction Dragging downward on the uterus and making counter-traction so that the line of incision is taut, the knife is pressed firmly against the vaginal wall, which must turn white for a few millimeters each side of the cut Charning is to be avoided as far as feasible and also bright redness of the platinum The perpetual refrain of this operation must be that of Byrne-"less heat ""less heat," "a deep dev roast," "a deep dry roast " The constant fault is too much heat and, as I have said and must continually resterate, this is unavoidable with light knives and small conducting The attendant Leeps his hand upon the switch and the operator calls for more or less current according to the density of the tissues and their vascularity

As soon as the vagina is freed, progress in the loose cellular tissue in front or behind the cervit goes tapidly—one dissects and one shows. The slight curve of the kinfe and its blunt edge clear away the bladder rapidly. The posterior section is freed to the cul-de sac We next have the flat band of the broad beaments to handle Keeping away from the uterus and a safe distance from the ureter, the base of the broad ligament and the uterosacral ligament are cooked and severed As we approach the uterme it may sometimes be dissected out by the knife. not too hot, and then carefully cooked, not with the edge, but with the flat of the knife. As is well known, the desired traction pulls into the field and away from the ureter a short length of uterine artery comparable, in a way, with what is removed by dissection At this point the ligature may be placed if desired The ureter may be dissected out. The cautery linke then frees the broad ligament to its thin upper portion Great care - and this is most important -- must be taken by the assistants not to use lateral tractors against the severed lower parts of the broad ligament, lest they drag the vessels open, if these have not been ligated

The uterus now being free below, the rest of the proceedings, in my judgment, may better be by ligature, if one proceeds to take out lundus or

adneva

THE EXTENDED VAGINAL OPERATION FOR CANCER OF THE CERVIX UTERI

BY GEORGE GELLHORN, M D , Sr Louis

Associate in Lynecolo.) Washington University Lynecol suctions Louis City Hospital Barband Free Skin and Capter Hospital and M. Likes Hospital

INCE methodical researches into the location of recurrences after operations for uterine cancer have established the fact that in about 90 per cent of the cases the disease recurred in the parametric and paravaginal tissues in close proximity to the vaginal scar, the simple hysterectomy, abdominal or vaginal, has lost all justification in cancer of the cervit. The only logical conclusion from these investigations was to find means by which this seat of predilection of cancer recurrences could be eliminated The object in view was accomplished by so called "extended" operations. of which two types sprang into existence the abdonunal, devised by Clark, Ries, and Rumpf and perfected and popularized by Wertheim, and the vagnal with which I wish to deal in the following

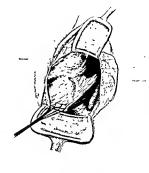
The dawn of this extended vaginal operation dates back as far as 1893, when Schuchardt (1 and 2) devised a deep lateral incision

through the pelvic floor by which an easier approach to the cancerous uterus was afforded The untimely death of Schuchardt prevented this operator from further developing his method, but his idea was enthusiastically taken up and perfected by Schauta (3), who in 1908 presented to the scientific world a method more radical than its source and so original in many points that we may well term it the Schauta operation. The underlying principle in the method is this to remove the greater part of the vagina and all of the parametric tissues together with the uterus The question of removing the pelvic beach clands is not taken into consideration in this method - a point which we shall have to discuss later

Within the scope of this brief review only a general outline of the technique of Schaute's operation can be attempted Those who wish to study the method more closely with the view of applying it in practice will find all







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necessary details in Schauta's extensive monograph entitled 'Die erweiterte vaginale Totalextirpation des Uterus bei Kollumkarzinom' (4)

After a thorough exceehleation and thermocauterization of the cancerous area, the operation proper hegins with

Meb 1 Craumersion of the ragina. Six or cight vokella are placed around the incumfrence of the vagina near the introtus and distal from these a circular incision is made through the vaginal wall. The vagina is now dissected off in an upward direction for several centimiters.

Mop 2 Fermation of signal saff. Thereby as "suff' is formal with his closely savel up by strong silk satures that take the pixe of the volsells. The upper portion of the vagans with the sancerous rater is thus shat off and contamination of fresh operative sounds is presented. The long ends of operative sounds is presented. The long ends of during the following stype of the operation for which fresh unstrumnts and gloses are to be used (fig. 1).

Mep 3 Separation of the Madder The dissection of the vagina is carried still faither inpaird until the vesico aginal septum is reached. If the disease does not extend too far the blandler can readily be loosened, if need be a small portion of the latter may be resected and the wound closed immediately. If a larger portion of the bladler be involved the case

must be considered inoperable, since the experience of all operators concede, as to the unfavorable resist by the continuous and late of extensive resection the concess bladfer. We have thus at our disposal a enterion as to the operability or inoperability of a given case at an early stage of the operation while it is jet time to stop without more serious damage.

Step a Paratagunal measure Not until this most important question has been settled to the field of operation laid open by the so-called Schuchardt incision. This metision sarris from the vaginal curtimension at the juncture of left and posterior saginal walls extends laterally to the lower end of the left labium minus turns now ilonward and parallel to the nextum and finally curties inward so as to encircle the left circumference of the anus and to terminate near the median line behind the anus.

The mersion thus splits the paracignal and pararest al tissue, the leator an and cocy god muscles the cellular tissue of the schorectal fossa as well as the skin of the perincum and of the lateral anal rigino down to the sacrum. The wound in the pararectal tissue is situated to the left only so far that the rectum and sphineter and are not injured. Lefthanded operators will find an incision on the right sale more convenient. Spuring arteries are liquated at once, cenous bleeding is usually copious, but is readily controlled by a thick gauge compress held in place by a weighted spectium.

The effect of this incision is surprising. Instead of a vaginal tube, we have before us a shallow exca-



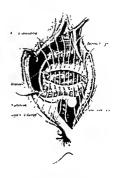


vation not deeper than one such and at the bottom of this the parametria are seen in full extent and within easy reach

Slep 5. Direction of uncters. This is at once the most important and most disclusive part of the operation, but it can be done in approved surgical fashion and under constant guidance of the eye. The uncertainty and sem bying above and behind the uncters are larged and severed. This releases of the operations is left unsured to the product of the pr

Step 6 Excision of the parameters. The cul desac of Douglas having been opened in the usual way, the two parameters are excised close to the pelvis wall. As the uterne arter, has been ligated previously, there is as a rule active bleeding only from the period of the period of the pelvis of the propose the stocyuletine represent. This requires ligations, while the venous bleeding is checked by mit tamporade of the deep casities on either sade

(Fig. 3)
Step 7. Remotal of the interus and closure of operative wounds. The rest of the operation differs but little from any ordinary vagual hysterectomy. Schauta suggests the leaving behind of the ovaries if they are normal. The persioneal eavity is closed carefully the stumps of the broad liquiments having.



For a

been drawn downward and fastened extrapertoneally. The large wound cavity beneath the personeum is loosely packed with gauze. The paravaginal incession is closed with buried and superficial suitures. Contrary to Schwitt I has eso frequently observed fat accrosis that I am now in the habit of insecting a egarette drain in the lower angle of the wound (Figs. 4 and 5).

It is at the request of your secretary. Dr. Franklin H Martin, that I have ventured to describe to you the various steps of this operation, which judging from the dearth of American literature, seems to be practically unknown in this country My personal feeling in the matter is that the recommending of the Schauta operation is not a promising undertaking Vaginal operations have fallen into disuse, and abdominal methods alone are popular at the present time. To the growing generation of operators, vaginal technique is fast becoming a terra incognita Yet if we claim for ourselves the distinction of specialists, in a class with the eynecologists of other countries where the line of demarca tion from general surgery is more sharply





Fig 5

lig 6

defined than in America, we must needs familiarize ourselves with every therapeutic procedure which has proved of value in our particular work. In medicine there exists not a single technical method which is applicable in all cases. As gynecologists we cannot afford to adapt the patient to the one method which we may happen to know, but it is obviously our duty to vary the method according to the needs of the individual case As regards the operative treatment of uterine cancer, even the most enthusiastic advocates of the radical abdominal method Wertheim (6). Franz (7) Kubinyi (8) and others admit that the latter because of its high mortality is contraindicated in fat patients, in women beyond the age of 60, and in those greatly reduced in strength by cachevia, sepsis or heart disease

Here then is a legitimate field for the schauta operation, for its primary mortality is strikingly lower than that of the extended abdominal operation. For the purpose of comparison, equally large series of either operation performed by operators of equal experience should be considered because thereby most of the objections against arguing from statistics are obviated

TABLE I PRIMARY MORTALITY

Abiomed

Abiomed

_	Chefatol	Duct	Percent		(spersted	Bred	Per cent;
~hauta ~chanta last) Thorn	80 163 104	1;	3 5	Meethe m Mertheim (last) Doeslerlein Bumm Noothorn and	500 200 131	3.0 3.1 3.1	15 0 17 0 28
	1_	١	<u> </u>	Knauer 11)	117	16	114 7

While this table shows the lesser danger to hife from the Schauta operation, it may be argued that by the extended vaginal method we cannot remove as much of the parametric tissues as by the abdominal radical operation. This may be true theoretically, but if we compare actual specimens obtained by either method, we will find that the difference is but slight (Figs. 6 to 8) — so slight, indeed, that the greater primary mortality of the abdominal operation in fat, cachectic, or very old patients outweighs the objection



be superfluous, not to mention the influence it may exert upon the primary mortality. There are now but few dissenting views on this proposition, which I upheld in the American Gynecological Society more than seven years ago (13).

This point of opposition, then, being eliminated, the two methods no longer differ in essential principles. Instead of being antagonistic, they complement each other. If we are familiar with both, we are in a position to employ individual treatment in the individual

case.

For reasons given above, the vaginal method lends itself, most of all, to the rather large category of old, fat, or cachectic patients and those suffering from heart disease. In very early cases of cervical cancer, both methods should be considered on equal terms. In squamous cell cancer, the vaginal operation should be given preference; in adenocarcinoma, the abdominal method. In moderately advanced cases, where the uterus is not freely movable, the abdominal operation should, in my opinion, be the method of choice. In this latter class of cases, where the uterus does not follow downward traction and the ureters are surrounded by cancerous tissues, the vaginal method meets with excessive difficulties, and consequently yields poorer ultimate results.

Thus far we have only considered the relative percentage of cures. The following table shows the absolute percentage of cures; that is, the proportion between the number of cases free from recurrence after five years and the total number of cancer patients admitted to hospital and dispensary for the same length of time.

TABLE III. ABSOLUTE PERCENTAGE OF CURES

Vagingi Schauta Thorn	Fet Cent 16 4 19 3	Abdominal Bumm Doedwien Weribeim Zwerfel Kröng Frans	Fe Ceu 16 17 15 15 15 15 17 17 17 17 17 17 17 17 17 17 17 17 17

This difference in the absolute end results finds its explanation in the difference of

The illustrations in this article were taken from Schauta's monograph "Die erweiterte vaginale Totalextirpation des Uterus bei Kollumkarzi-

TABLE IV.	OPERABILITY .
Vaguat	Abdominal

Vaga saf				Abdominat				
	Total of Cases	Operated	Per cent		Total of Cases	Operated	Per cent	
Schuuta (5) Schanta Lest 3 yrs Thorn (10)	1 007 217	108	54 50-70 44 2	Wertheim (6) Wertheim last 2 yrs Doederlein (24) Bumm (25) Zweilel (27) Lianz (7)	218	116	50 61 9 50 7 60 9 51 8	

This greater percentage of operability is due not so much to the fact that infiltrate parametria can be excised more fully from above than from below, as to complications which would ipso facto call for abdominal intervention. Schauta and Thorn mention, under this heading, pregnancy, fibroid, hernia, ovarian cystoma, and tube ovarian tumors.

Franz (7) claims that the more cases operated upon, the more cases will be cured Mayer (14), on the other hand, remarks that a low percentage of recurrences is proportionate with a low percentage of operability; if the latter rises, the number of recurrences increases in equal proportion To give but one concrete example. Franz subjected 82 per cent of his cases to the abdominal operation; Thorn 44 2 per cent to the vaginal method Yet Franz had only 27 5 per cent of absolute cures in contradistinction to Thorn's 10 5 per cent In other words, while Franz operated on almost twice as many cases, he had only 8 per cent more cures than Thorn. Under these circumstances, and further realizing that the results of Franz are thus far the very best obtained by anyone, can we still subscribe to the statement that the abdominal operation is the only one justified in cervical cancer?

In this greater percentage of operability there are included very far advanced cases, in which the infiltration of the parametria has extended close to the bony wall of the pelvis. Granted that in some few cases this infiltration may be but inflammatory in nature, the probability exists that in the vast majority of instances it is due to cancerous invasion. Even though in such "border-

cases the operation may be possible from rely technical standpoint, I believe that cases should be excluded from any operation, whether abdominal or vaginal. The surgical axiom has been firmly established that when dealing with cancer we must operate in healthy tissue well outside of the affected area. In such far advanced cases of uterine cancer the observation of this general surgical rule exists only in theory In reality, we have usually been forced in such cases to place our incisions in closest proximity to cancerous masses, and if the patient did not die at once, the inevitable result has been a speedy recurrence, or more correctly, a continued and even more rapid growth of cancerous tissues that were left behind. The oft-expressed idea of giving such nationts the benefit of the doubt appears to me a fallacy As a general proposition, they are worse off alter the operation than before Their morbidity, including accidental injuries, is greatly increased In contradistinction to others, I have almost invariably found their recutrences much less amenable to palliative treatment than the primary tumor in cases in which no hysterectomy had been attempted The psychic effect of an operation in such horder line cases is all too ephemeral llopefulness and encouragement give was to even dieper despair when, so soon after the pain and anguish of an operation, the old symptoms reappear with increased force If we consider not only the pitifully small group of cases which might perhaps be cured, but also the very much larger number of patients that are not benefited, we will, for the present at least, not persist in an excessive radicalism cases can be made comfortable and their lives prolonged by pullitative means if only our aim is directed towards the elimination of bacterial infection of the cancerous area From the study of a sufficiently large material I have arrived at the conclusion that it is the mixed infection, with streptococci or staply lococci, which renders the lot of cancer patients so deplorable This mixed infection once removed, the clinical picture of cancer loses many of its dreaded features for a consider able length of time, and then these advanced cases, taken as a whole, are better off under nalliative treatment than after having been subjected to a dangerous and unpromising operation

Yet one must agree with Thorn (14) when he says that this extreme radicalism has served a certain purpose. It has proved to us that by extending the limits of operating to the utmost, the coveted goal cannot be reached. Only the future will show whether the educational campaign which is being so universally waged in Germany and other Luropean countries and here and there in our country (for instance, by the Barnard Free Skin and Cancer ffospital in St. Louis) will yield appreciable improvement in our final

results The days of passionate partisanship for one or the other method seem to be about over, and the time is ripe for a more quiet and objective discussion. Until the long hoped for cancer remedy is discovered along biochemical lines, we may succeed in reducing our primary mortality and obtaining a greater percentage of cures in the patients operated upon if we do not unduly extend our operations to far advanced cases, and if we individualize more carefully than in the past, and select from the methods at our disposal the one which offers the best chances in a given case. The arguments presented in the foregoing may thus be condensed in the statement that both the vaginal and the abdominal extended methods have their place in the operative treatment of cancer of the cervit uters

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DISCUSSION BY HOWARD CANNING TAYLOR, M. D., NEW YORK CITY

A N operation for carcinoma of the uterus may properly be performed to accomplish one or more of three ends — we may operate to save life; we may operate to prolong life, we may operate in order to make the patient's fife more agreeable, more bearable, and more satisfactory to her, and I might say also to her firinds. In considering any operative procedure, we must consider the possible benefits along all three lines.

Speaking in general, the operation indicated for any carcinoma is the most extensive and most radical operation possible that is not associated with too great a risk to the patient's life, and which is not followed by too great deformity or interference with functions. This rule applies to carcinoma of the uterus

as well as elsewhere.

In regard to carcinoma of the uterus, any deformity or interference with functions can be at once ignored, as we have only to consider the risk to the patient's life. When we consider the risk of the operation to the patient, we must remember that we are giving the patient her only chance, and no one with a real knowledge of the conditions of carcinoma of the uterus would besitate to take the greater risk, if by doing so there is a corresponding greater chance of a permanent cure There is, however, a risk beyond which it would not be right to go, and it is our problem with each individual case to determine, bearing in mind the risk to the patient and the chances of a cure, what it is best to do my opinion, for the case that is considered operable there is a reasonable operative risk. the operation elaborated by Wertheim, and described to-night by Dr Weibel, is the operation usually indicated So far as the risk to the patient is concerned, we have statistics from operators abroad, as well as statistics from a number of operators in this country, to prove to us that the risk is not so great that it cannot be assumed when we know the possible result. I have myself performed the operation enough times so that I will not hesitate to do it in a case that is in fair surgical condition.

Regarding the vaginal hysterectomy for carcinoma of the uterus, as advocated by Schauta and described to night by Dr. Gellhorn, I am very glad that I had an opportunity this past summer to see it done in Schauta's clinic. It certainly is a remarkable operation, and I was surprised with the exposure of the parts and the ease with which the ureters were isolated and freed from the connective tissue. I was surprised, too, at the amount of pelvic tissue that it was possible to remove through the vagina In doing the vaginal operation there is no possible opportunity of removing the pelvic glands, and cases have been reported by good authority where pelvic glands have been removed and the patient remained well beyond the five-year period These cases would certainly have been lost if a vaginal operation had been performed Of the two, there is no doubt that the vaginal operation is the more difficult one to perform, and it would require considerable experience before one could do the operation as thoroughly as it is done in Schauta's clinic-I would reserve the vaginal operation for very fat women, when the Wertheim operation would be associated with special risk, or in the cases with complete prolapse

I have had no personal experience in the operation as described by Dr Werder, but it does not seem to me that it can compare with the operation as described by Professor Wertherm His statistics, of course, are very fine and I doubt if there is another operator in this country who has such a large percentage of cures at the end of five years, even when we consider his low percentage of operability. When we consider the different steps of an hysterectomy through the abdomen, the infundibulopelvic ligament and the round ligament are divided at such a distance from the growth that it is immaterial whether they are divided with the cautery or with the scissors Recurrence rarely occurs there. The part that is most likely to be the scat of a recurrence is in the cellular tissue at the side of the cervix. Certainly the Wertheim operation, where the connective tissue is removed out as far as the pelvic wall, removes more tissue than is removed or affected by the heat of the cautery. In the more advanced cases, where it would be necessary for Dr. Werder to dissect free the ureters in order to apply the clamp, either he must do what is done in the Wertheim operation, that is, dissect first with the scissors, or else he does not get as far away from the disease as is done in the Wertheim operation. In certain of the advanced cases it would be impossible to apply the cautery clamp at all, and these are evidently considered inoperable by Dr. Werder, although they might be undertaken by one doing the Wertheim operation, as his percentage of operability is decidedly lower than that of men who favor the Wertheim operation He, of course, does not consider the pelvie glands at all It was my good fortune last year to see Dr Werder do one of these cases by his method, and I appreciate the skill with which he did it, and I appreciate the quality of the statistics which he has supplied to us

The cancer problem as it exists to-day consists of two separate factors. The one is to discover the cause of the condition, together possibly with a serum or other agent that will effect its cure The other is to use the knowledge which we already have to the The former best interests of our patients is more directly connected with laboratory work; and although it is more than possible that a clinician may have much to do with the discovery of the cause of cancer, it is not part of our consideration to-night To-night we are considering how we can best use the knowledge and information that we now possess so that we can accomplish the greatest good to the large number of women who are suffering or who may in the future suffer from cancer of the uterus The first and most important step is to get the patient at the earliest possible time. It does not make any difference what operation is performed; unless the patient is seen and brought to operation while the disease is in its relatively early stages, there is no chance of saving her life. There is no doubt that the difference in the statistics reported from abroad and the statistics of the American operators is due in part to the difference in the stage at which

the case comes to operation. figures furnished me from the New York Board of Health early this year, I learned that, of the cases recorded at the Board of Health as having died of carcinoma of the uterus, there had been no operation other than a palliative cauterization in 75 per cent, and in only 25 per cent had there been an hysterectomy. Of these 25 per cent, undoubtedly a large proportion were operated upon, not with any idea on the part of the operator that he was going to permanently cure his nationt, but with the idea of prolonging the patient's life or relieving her symptoms. I do not myself believe that even here in New York, where conditions are comparable to those in other large cities, one case in twenty of carcinoma of the uterus is operated upon at a time when there is any real chance of permanently curing the patient Certainly my own individual experience would not make the percentage higher If this is true in the city, where we have active hospital services ready to take these cases when we can get them, what must it be in the smaller outiving communities? To get our cases of carcinoma of the uterus earlier, it is necessary that our physicians recognize the importance of the early symptoms and the necessity of a thorough examination when the patients first apply to them It is also necessary that our women be taught the early symptoms of carcinoma of the uterus, and the fact that an operation is a possible but the only cure, so that they will consult their physicians at once. We are just beginning to teach women at large - partly by lectures, partly by articles in popular magazines, partly through nurses and physicians - to know the early signs of carcinoma of the uterus, but we have not yet done all that we should do, and until we do more we are not going to reach women early enough to affect these statistics Beyoud question, therefore, our most important work is to so inform women at large that they may know the early first symptoms of carcinoma of the uterus, so that they will come to us at a time when it will be possible for us to hope to cure them

During the past summer, while in Germany and Australia, I saw a number of cases of carcinoma of the cervix operated upon. If saw two cases where no attempt at removal was made after the abdomen was opened. I saw one case that was comparable in its extent to cases that come under my own observation. All the other cases, six or eight in all, were earlier than most that I see and consider operable, and earlier than those

operated upon by such men as I have seen operate on carcinoma of the uterus here in New York. If it is possible for the medical profession in Germany and Austria to so educate their women that they get their cases of carcinoma of the uterus early, then it is possible for us to do so, and we are neglecting our medical duty if we neglect it.

RESULTS AFTER THE WERTHEIM OPERATION FOR CARCINOMA OF THE CERVIX OF THE UTERUS'

A PRELIMINARY REPORT FROM THE GYNECOLOGICAL CLINIC OF HOWARD \ KELLY, OF THE JOHNS HOPKINS HOSPITAL

By J CRAIG NEEL, M D BALTIMORE Assistant Resident Gynecologist to the Johns Hopkins Hospital

A LTHOUGH the radical abdominal operation for patients suffering from carcinoma of the cervix of the uterus was advocated as early as 1895 by Clark and Ries, and in 1898 by Wertheum, before 1900 very few cases had been treated by this method in this clinic Since 1900, however, in practically all the operative cases, the abdominal route has been employed, and the results here given are hased upon such cases from January, 1900, to January 1912.

TYPE OF OPERATION

Although the original operation still remains the same in its fundamental principles—the wide excision of the uterus with the parametria, and the removal of the surrounding lymph structures en masse—from time to time various modifications have been adopted in order to render the technique more perfect. It does not come within the limits of this paper to discuss these modifications; suffice it to say here that the operation as done in Dr. Kelly's clinic corresponds to that described and practiced by Wertheim.

PERCENTAGE OF OPERABILITY

Inasmuch as we possess no means of determining the absolute progress of the disease, in the majority of cases the decision as to suitability for the radical operation must depend upon the degree of direct extension of the local lesion Judged by this standard, in the series of cases reported by Cullen from 1893 to 1890, the percentage of operability was 51.7. During the last five years, 125 cases of carcomom of the cervix of the uterus have been admitted to this clinic. One patient refused operation Of this number the radical abdominal operation was done in 67 cases, thus giving a percentage of operability of 54.

It is somewhat discouraging to note that, although more than a decade has passed, the percentage of operability has remained practically the same Great efforts are being devoted to the working out of the operative technique, but unfortunately its successful employment is tremendously handicapped by the failure to recognize the early symptoms. The usual history given by these patients is that they have suffered from irregular bleeding for from seven to nine months, and have submitted to various treatments.

Nevertheless, the incessant campaign, waged more especially by Winter, is bringing forth encouraging results. Is it not time that concerted devotion and earnestness, similar to that used in fighting tuberculosis

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so successfully, be organized to save these patients, who are otherwise irretrievably lost?

294

STATISTICS

From January, 1900, till January, 1912, the radical abdominal operation has been performed in 136 cases; of this number. primary death occurred in 28 cases, giving a total primary mortality of 20.5 per cent. During the last five years, 125 cases have been admitted, out of this number the radical abdominal operation has been done in 67 cases. Primary death occurred in 8 cases, giving a primary mortality of nearly 12 per cent

In 70 cases a period of five or more years has clapsed; of these patients, 61 have been traced and a lost track of; one patient died two years later from pneumonia, 14 are alive and well, while the remainder gave practically unmistakable evidence of recurrence. The percentage of permanent cures, based upon the number of cases in which the complete operation was done, excluding those lost track of, is 23 3 per cent While granting that those 9 patients lost track of died from a recurrence, the percentage of permanent cures is 20 3 per cent. Of these 70 cases, primary death occurred in 20 Hence, if we deduct from the total number of cases operated on the number of primary deaths (20), the number dying from other causes (1), and the number lost track of (9), we get a percentage of cures in 35 per cent of the cases

PROCEDURES TENDING TO LOWER PRIMARY MORTALITY AND MORBIDITY

The primary mortality, comparatively speaking, has been universally high; chiefly because, owing to their generally weakened condition, the patients were unable to stand such an extensive operation. Primarily, as in all operations, the first duty of the surgeon should be directed to the immediate results to the patient, since there can be no consolation in the much-quoted remark, "The operation was successful, but the patient died." Hence, any procedure which will lessen the time required for the operation, the immediate shock, and yet guarantee the

same thoroughness, should be employed in every case.

1. Disinfection of the grouth. Although it is doubtless impossible to render the carcinomatous area aseptic, there is much to be gained from proper measures along these lines For several months the following technique has been employed here:

a. The usual perineal and vaginal cleansing-soap and water, bichloride of mercury

(1.1000), and alcohol, 70 per cent

b. Thorough cauterization of the primary growth with "soldering irons" or the Paquelin cautery c The application of benzine iodine solu-

tion (1 1000 iodine) to thoroughly dehydrate the field

d The application of tincture of iodine (3 5 per cent)

e An iodoform gauze pack placed in the vacina

After a thorough cauterization of the growth, the cervical canal should always be dilated Occasionally this procedure brings to light the existence of a pyometra, which is an absolute indication for postponement of the operation

As yet the series of cases treated in this manner is too small to warrant conclusions. but it is of interest to note that none of these patients has subsequently developed peritonitis

2. The incision In all these cases a long midline incision has been employed In very fat patients, the resection of an ovoid area of skin with the subcutaneous fat in the midline (horizontal lipectomy) has been found to be of great advantage By this method the denth of the field of operation is reduced by from 5 to 7 cm, and the ultimate result adds greatly to the general personal comfort of the

3 The catheterization of the ureters. Although the use of ureteral catheters has not been followed uniformly, there has been no hesitancy in their employment. With the greater facility of catheterization incident to the improvement of cystoscopic technique, this procedure can be carried out within a few minutes before the general anæsthetic is given, and will prove to be of the greatest

possible assistance during the course of the operation. It is especially astisfactory in obese patients, where the exposure is difficult, since it lessens the time necessary for the isolation of the ureters and renders comparatively easy the control of hamorrhage from the vaginal plesus of veins, which in many cases is the most troublesome part of the entire operation.

From a study of our cases we are led to conclude that the liability to ureterovaginal fistule, or secondary infection of the urinary system, is not increased by this procedure. However, the following cautions should be observed:

a. The minimal amount of manipulation, with least possible trauma, is to be exercised.

b The ureteral sheath should not be disturbed at any point.

c. The catheters should be removed when the ureters are completely isolated, and further manipulations should consist in rolling the ureters over, with the least possible disturbance to their blood supply.

4 The lymphatic glands As it is generally conceded that the lymphatic glands are implicated in from one third to one half of all operable cases, and since we have no means of determining that involvement except by microscopic examination, theoretically speaking, the ideal operation would include their resection in all cases. However, the present operative facilities and technique do not justify such an extensive operation, on account of the great increase in the primary mortality following such a procedure. Hence, for many years no attempt at removal of the lymph structures other than those of the parametria has been made.

5 The resection of the vagens After the thorough dissection of the parametrial and vaginal tissues to a point well below the extent of the growth, they are resected, after the vaginal canal has been swabbed out to remove any infected accumulation. With a thorough preliminary cauterization, the widest possible resection, with probably the least risk of immediate danger to the patient, is obtained by the use of sharp dissection.

6 Pelvic closure. As in all abdominal operations, denuded areas should be closed

over as completely as is permissible. By this step of the operation the liability of postoperative intestinal obstruction is reduced and the injury to the ureters greatly lessened.

On account of the possible infection present in all cases, some form of pelvic drainage is to be advised. In this clinic the most satisfactory drainage has been obtained by a small cigarette drain, composed of gauze surrounded by rubber protective, placed

through the vaginal opening.

- 7. The postoperative treatment. Aside from the general measures for comhating shock, there are many procedures which may contribute to a smooth convalescence. The excessive trauma to the bladder walls almost invariably causes temporary vesical paralysis. and formerly it was not unusual to catheterize a patient from thirty to forty times For the last eight months the preoperative treatment has been varied, so that all patients have water forced until they go to the operating room This, together with the forcing of liquids practically as soon as the patient becomes conscious, and the administration of salt solution by the rectum and by infusion, has reduced the number of necessary catheterizations very markedly. Patients who have been subjected to a definite injury to the bladder are, however, catheterized more frequently, to prevent overdistention, and occasionally a retention catheter is left in the bladder for a few days. As far as possible, the immediate comfort of the patient is to be sought Probably no one factor contributes more to this end than the employment of the Fowler position. For several years, in the care of these patients, the Gatch bed has been employed, by means of which they can occupy the sitting posture. The following advantages are to be gained by such a position;
 - Pelvic drainage is facilitated, with limitation of the infection to the pelvic peritoneum
 - Nausea and vomiting are decreased.
 Respirations are performed more easily,
 - since the pressure from the distended abdominal viscera upon the diaphragm is greatly lessened.
 - 4. The liability of postoperative pneu-

monia is greatly decreased by frequent modification of this posture.

CONCLUSIONS

From a study of the cases treated at the Johns Hopkins Hospital, the following conclusions are drawn:

- The extensive abdominal removal of all uterine cervical catcinomata is justified where there is any hope of complete excision.
- 2 An exploratory laparotomy is often necessary to determine whether or not a case is operable.
- 3 The preliminary catheterization of the ureters is a valuable sid, especially in fat patients, and does not necessarily increase the probability of fistulæ or secondary infection of the urinary tract
 - 4 Preliminary cauterization and disin-

fection of the primary growth is advisable in all cases.

- A horizontal lipectomy in obese patients decreases the depth of the field of operation and shortens the time necessary for its completion.
- All patients should be kept in the Fouler position for several days, unless this is otherwise contraindicated by symptoms of surgical shock
- 7 By improvements in the technique of the operation, the primary mortality has been decreased from 28.5 per cent for the first seven years to 11 7 per cent for the last five years.
- 8 Aside from the discovery of the etiological factor of carcinoma of the cervix of the uterus and its successful elimination, the greatest hope lies in the early recognition and wide excision of the primary growth

INTRATRACHEAL ETHER ANÆSTHESJA!

1400 CASES FROM 22 SURGICAL CLINICS

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I NTRATRACHEAL anasthesia, though a familiar term now to those who have employed this interesting method in surgical clinics, is nevertheless deserving of a brief description to those unfamiliar with it.

with it. A small 22F tube is passed through the mouth, larynx, and trachea to the bifurcation of the bronchi Ether vapor is then forced under constant moderate pressure through this tube, escaping around the tube Intra tracheal anæsthesia is not necessarily intra tracheal insufflation, and it is a mistaken idea (though a common one) that intratracheal anæsthesia is of necessity attended by cessation of the respiratory movements If the escape of vapor is diminished by using a larger tube and restricting the unoccupied space in the trachea, and if the entering fumes are accompanied by an increased volume of air, a condition of apnœa may result This is

permissible and sometimes unavoidable in thoracic operations with wide open pneumothorax. In intratracheal anasthesia, however, it is preferable to preserve the respiratory movements, inasmuch as they serve as one of the best guides to the depth of the anæsthesia in this narticular method

The first account of animal experiments performed with the employment of this method, I published in 1695, thanks to the encouragement and suggestions of Professor Cannon of the Harvard Physiological Laboratory. The entire credit for developing the method along physiological lines in an admirable series of observations, and for introducing it to surgery, is due to Meltzer, Auer. Elsberg, and Ouinby.

By the instigation of Dr. F. B Harrington I was given the opportunity to construct an apparatus for use at the Massachusetts General Hospital, and through his courtesy

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and that of other members of the staff I have employed the method clinically in a series of 70 cases.

A time is always reached in the development of any new method when the experiences of a considerable number of operators must be accumulated, from which deductions may be drawn as to the safety, applicability, and usefulness of the method in question. Intratracheal anæsthesia has been employed clinieally for four years. The experiences and deductions of any one administrator may well be open to question. For this reason I was reluctant to base my paper upon a series of 70 cases, lest I be credited with undue enthusiasm and with conclusions biased by a complete absence of unfavorable sequelæ following the use of an apparatus of my own construction And I may say at this point that this paper is not a discussion of the comparative perfection of different forms of apparatus. It is true that all of the machines constructed for this purpose which have been thoroughly tested have produced, generally speaking, equally good results. Our interest is rather in the anaethetic method itself than in the design of apparatus

In order to accumulate sufficient data from which to draw definite conclusions I employed the following method Writing to fifteen friends who are employing intratracheal anasthesia. I enclosed twelve questions regarding their experiences Each was requested to send the names of others in his vicinity employing intratracheal anaesthesia. and to these in turn the questions were likewise sent The courtesy with which these thirty-fave surgeons and anaesthetists have responded to my inquiries has been most gratifying. Twenty-two of the leading surgieal elinics in the country are represented, in addition to a number of private clinics Were you to know the sources from which this material is collected, you would agree with me that it may justly serve as a basis for rational deductions

The series thus obtained includes 1402 cases in which intratracheal anaesthesia was employed. It should be borne in mind that a considerable proportion of the operations were of the type generally associated with

high mortality, including the more serious thoracie operations and surgical procedures about the head, neck, and pharynx. In this series of approximately 1400 cases, seven deaths occurred In one of these the surgeon reports that he is inclined to credit the death (from broncho-pneumonia) to the intratracheal anæsthesia, inasmuch as at autopsy the infection appeared to have started from the bronchial mucosa In a second case death occurred following emphysema, in which it is stated that a rupture of the lung occurred as a result of the tube being forced by an assistant who was holding it into one of the main bronchi. The apparatus was not fitted with a safety valve, and the tight fit of the tube in the bronchus prevented the escape of air around it, resulting in overpressure unreleased. In a third case death occurred five hours after resection of the superior maxilla for malignant tumor. Death occurred in the fourth case on the third day after amoutation of the tongue death, on the cighth day, from pneumonia following laryngeetomy for carcinoma, is recorded The sixth fatal case, of pleuropneumonia, followed a thoracotomy for cancer of the ecsophagus. Death followed pneumonia in a seventh case, after an operation for some septic process not described

The one case of bronche-pneumonia in which the surgeon credits death to the method, and the case of death following rupture of the lung, should doubtless be accepted as induced by intratracheal amesthesia. The so-called septic case is unexplained. The remaining four fatalities followed operations the severity of which is generally recognized.

In these t400 cases four additional pneumonia cases are reported, with recovery. In all of these the recorders credit the infection to other causes than the method of anesthesia. To claim that these pneumonias might also have occurred by other methods of anesthesia would suggest the form of arguing not uncommon among those who are enthusiastic to prove the harmlessness of a procedure in which they may be vitally interested. I will therefore not attempt to influence you in your deductions as to the source of infection in six cases of post-operative pneumonia out of

1400 administrations of intratracheal anaesthesia.

In reply to the question regarding the occurrence of any complicating sequela to the anæsthesia other than pneumonia or emphysema, only one case was reported, that of aphonia of three days' duration following

a difficult intubation with a woven catheter. Among the 12 inquiries in the circular letter referred to, the questions of postoperative bronchitis, laryngitis, tracheitis, and pharyngitis were raised. Postoperative bronchitis was mentioned in one case only. Eighteen instances of tracheitis and pharyngitis are admitted in this series. With all due respect to the veracity of the several contributors, I am led from my own experience to believe that the low percentage of tracheal and pharyngeal irritation reported results from the fact that the irritation is generally so slight that the patient does not make the fact known In my own series of 70 cases I made a point of questioning the patient as to this irritation, and not infrequently heard a "scraping" sensation described which the patient generally regarded as insignificant

May we not conclude from these data that the intratracheal method employed both by skilled and unskilled amesthetists and surgeons has been attended with less danger than many forms of amesthesia, and with as few unfavorable sequelze as with the safest ames-

thetic methods2

Furthermore the question arises as to whether, thanks to intratracheal ether, a considerable number of operations in this series did not result more sucressfully than had they been performed under other forms of annesthesia. It would be interesting if possible to determine whether the mortality in tongue, jaw, and brain operations in this series had not perhaps been lower than other statistics would inducate, where the mask and cone anaesthesias had been employed. This leads me to mention the so-called advantages of intratracheal anaesthesia.

The intratracheal method provides a constant and uninterrupted supply of fresh air, to which is added a greater or less proportion of ether vapor. Cyanosis can be and is almost always avoided. Poor posture of the patient,

drooping of the jaw, falling back of the tongue, or masal occlusion do not result in obstructed breathing. The entrance and escape of air, thanks to the presence of the tube in the glottis, are uninterrupted.

One would naturally suppose that the presence of a tube in the plan; nx and traches would result in bypersecretion of meues On the contrary the opposite is true. A patient anesthetized by the cone method in preparation for the intubation generally enters the operating room with the pharynx filled with mucus After the intratracheal tube has been introduced the pharynx is wiped out, and when once clean it remains so through the operation. The sir escaping back around the tube tends further to dry the mucous membrane of the mouth and pharyax.

In view of our recent efforts to diminish postoperative shock by every possible main, it cannot be denied that complete oxygena, it cannot be denied that complete oxygena for many or the continued cyanosis are factors of importance in reducing shock. Even granting that continued cyanosis throughout an operation may not in itself influence the postoperative programme, the undue muscular exertion of a patient with obstructed air passages through a long operation unquestionably contributes to the expenditure of energy.

Postoperative pneumonia and pulmonary abscess are not uncommon sequelte to operations upon the tongue, jaw, and pharynx. Some of these infections are by direct inhalation of septic material. It is a notable fact that the ordinary accumulations of blood and mucus attending one of these operations are prevented from entering the glottis by the air escaping from the trachea. It is reasonable to assume that the avoidance of this inhalation is an added security against postoperative pulmonary complications.

Surgeons who have operated under the employment of this method will, I think, universally agree that the duration of operation is lessened Operations about the head and laryax under other methods of cherizing are generally interrupted at frequent intervals by allowing the anxishetist an opportunity to apply the cone in order to maintain anxisthesis. The resulting and constant tendency of the patient to be light in anxisthesis acts

as an impediment to progress, both by the tigidity of muscles and occasional vomiting. By the intratractical method such interruptions are obviated. With the pharyax partially packed during mouth and jaw operations, retraction of tissues remains permanent, and hemorrhage is better controlled. A considerable amount of time is thus saved, which is of unquestionable advantage to the patient Meanwhile, thanks to lack of interruption, the improved hemostasis and facilitated operative technique [avor the final results.

In connection with hemostasis, it should be mentioned here that, owing to the constant complete oxygenation and relief of respiratory obstruction, congestion of the tissues of the head and neck is reduced operators, in reply to my inquiries, have agreed as to the value of this element in such operations; and those of us who have operated or witnessed operations in these regions under intratracheal angethesia have noted a cleaner operative field with less bleeding surgeons have written of their approval of the method in goiter cases, stating that the lack of congestion following the easy breathing has been a contributing factor in the successful outcome of cases

It may be said, therefore, that intratracheal anæsthesia is the one of choice in operations about the head and neck, including brain surgery. Some surgeons and anæsthetists are sufficiently enthusiastic to believe that this is a form of anæsthesia indicated in operations on other parts of the body. Where nitrous oxide and oxygen are indicated there would seem to be no occasion for intratracheal ether On occasions where the drop ether method would ordinarily be selected, some of us would prefer to employ intratracheal etber. This is particularly true in the case of plethoric and obese patients where the respiratory pas sages are not infrequently obstructed during deep anæsthesia, such patients, we not uncommonly find, are to a greater or less degree cyanotic during long operations Suprapubic prostatectomies and female pelvic operations performed in a marked Trendelenburg position are often attended with cyanosis, despite well-applied drop ether and the introduction of nasal tubes. Granting again

that cyanosis from the standpoint of anociassociation is a factor in post-operative shock, the intratracheal method is indicated in such operations

As in spinal and intravenous anæsthesia. the question which we must decide is whether the history of intratracheal insufflation would contraindicate its use in all but that group of cases about the head and neck to which we have referred. I am of the opinion-and I shall listen with interest to the discussion regarding this opinion-that the reports from 1400 cases have been sufficiently satisfactory to indicate that intratracheal anæsthesia is as safe a method of ether anæsthesia as we have at our disposal, regardless of the seat of the operation I have ceased to believe that one is not justified in inserting an intratracheal tube unless there is a particular indication for its use This cannot justly be said of spinal anæsthesia, for instance, inasmuch as it may be argued that in a certain number of cases post-operative accidents have occurred which would doubtless have been obviated by ether anæstbesia I am not satisfied that this is true of intratracheal anasthesia, and I fail to find any argument against its general use provided the operator prefers to employ this method

Those of us who have managed intratracheal anæsthesia during general surgical operations are universally impressed with the ideal conditions which exist. The patient appears to be under a hypnotic rather than an anæsthetic Pulse and respiratory records during long operations show very slight oscillations from the normal. One sees none of the usual changes from quiet to stertorous breathing commonly accompanying the variations in the course of an ordinary ether anæsthesia: and inasmuch as the factors in administration all remain constant, the respiratory and circulatory functions of the patient appear to be equally unvarying I believe that this constancy is an element in reducing postoperative shock

The use of intratracheal and pharyngeal ether with the help of apparatus has in the past two years demonstrated that mechanically applied ether produces an entirely new form of anasthesia, and it is a question whether

it is not showing us that we have hitherto underestimated the best anasthetic propertics of ether The air supply remains constant, as it is driven from a rotary pump, and the amount of warmed ether vapor allowed to enter the mixture need not be altered after the first ten minutes until within fifteen minutes of the end of the operation. A light mixture steadily supplied keeps the nationt constantly on the verge of "coming out". but at the same time completely relaxed The anæsthesia in a way resembles what might be described as a continued primary anasthesia. The length of the operation under a given mixture, arranged early in the operation as best suited to the patient in hand, does not apparently influence the depth of the anxisthesia, although the mixture remains constant throughout In other words, the natient's immunity from the given dose of ether does not materially increase or diminish in the course of an hour's administration.

The total quantity of ether given is distinely reduced, and I recall one case of my own series in which six ounces was sufficient or an operation lasting two hours and a quarter. In skillfully applied intratracheal annexthesia the amount of ether is reduced to that required in ether anexthesia by the rebreathing method; and the omission of the rebreathing element must be admitted to be of advantage, because of the lack of tendency to incomplete oxygenation.

It must be remembered that intratracheal anæsthesia as such was an accidental discovery in the course of experimental surgery of the thorax under intratracheal insufflation It was discovered that, in the presence of wide openings in both sides of the thorax, oxygenation of the blood could be maintained by a constant supply of fresh air delivered through an intratracheal tube at the bifurcation of the trachea. Even with all accessory respiratory movements excluded by the administration of curare, the air exchange in the pulmonary alveoli was yet sufficient to prevent an excessive accumulation of carbon dioxide In other words a new and simple method was discovered of preventing the dangers of pneumothorax during thoracic operations. Obviously it was necessary to add ether to

the insufflating air, and the anasthesia thus produced was in itself so satisfactory that intratracheal anasthesia has come to be employed as such in operations other than thoracic.

Experience with negative pressure, positive pressure, and insufflation has demonstrated that less than 5 per cent of routine chest operations require any mechanical aid to the respiratory functions. In this 5 per cent of chest cases insufflation is doubtless the preferable method. In the remaining of per cent, although opening the thorax is of no danger in itself, the intratracheal method of anasthesia is unquestionably the ideal one. In my own experience of approximately 130 thoracic operations I have employed no form of nnæsthesia comparable to this Dr. Freeman Allen has frequently demonstrated to me the value of anxisthol, ether, and chloroform, interchangeable and skillfully employed. Despite the limited lung function generally present, as in a case of chronic empyema, Allen has by such selective anasthesia prevented cyanosis And yet intratracheal anæsthesia in these routine chest cases is even nearer idea! The operation may place the patient in an apparently gramped position in order to render a portion of the thorax more accessible The intratracheal apparatus may be so adjusted that a certain degree of insufflation results, improving the tidal air and preventing cyanosis and dyspnora If in the course of a routine thoracie operation it is discovered that the lung is less adherent than presupposed, and mechanical aid to respiration is indicated, the intratracheal tube, being already in place for anaesthetic purposes, is now adjusted to provide insuffiction and the dangers of pneumothorax are rapidly overcome.

Another advantage is offered by the presence of the tube in cases of arute and subacute empyema. With a finger in the thoracotomy wound, the lung may at will be partially inslated, thus indicating whether it is yet mobile or is held by adhesions which should when possible be broken up to prevent the occurrence of chronic empyema. The introduction of a tracheal tube therefore is the indicated procedure in all thoracic cases,

whether of the 5 per cent of cases requiring insufflation or of the remaining 95 per cent in which anæsthesia alone is indicated.

Post-operative nausea and vomiting are admittedly factors in increasing the total destruction of brain cells attending any operation. In my circular letter the following question was included: How great, in your experience, is the extent of nausea and vomiting with intratracheal ether compared with that following ether anæsthesia by well applied drop methods? Answer, More, less; the same. One third of the writers answered that the degree of nausea and vomiting in intratracheal ether is the same as in the dron method. Two thirds replied that it is less than in the drop method I may add that in my own experience the degree of nausca has been the same in both methods.

A word about certain features in the technique of the intubation. It is clear to me that all surgeons should become familiar with some form of technique of introducing an Intratracheal tube: first, in order that they may use the method when intratracheal apparatus is at band, but when there is no one familiar with intubation, second, in order that tracheotomy may become less common in certain emergencies On one occasion I could not refrain from suggesting this to a throat surgeon An cesophageal speculum, from prolonged usage, had pressed upon the trachea and caused serious cyanosis With cesophagoscopes, bronchoscopes and Jackson specula at hand, he was on the point of doing tracheotomy The intubation was performed skillfully and with immediate relief

Some of those present here have been important contributors to the technique of intubation. There are three methods: the epiglotitis may be raised with the left foreinger and a soft rubber tube guided to the glottis by a hollow metal introducer, as suggested by Cotton; an illumination speculum may be introduced, providing direct vision of the laryngeal opening through which the tube is passed; a braided tube or a rubber tube with stillette contained may be passed by sense of touch directly into the larynx.

The circulating letters brought responses to a question regarding the choice of these methods as follows: Soft rubber tubes of the Quinby type have been employed by approximately one half of the correspondents. The remainder have used a braided cathleter or a stitetted rubber cathleter. An equal number have utilized the hollow introducer and the direct vision methods.

Eynard has recently constructed for me an intratracheal catheter with two side eyes and a blind cup at the tip which receives the olive shaped end of a steel stillette. I have found it very satisfactory. Orignally I used with like success the Cotton introducer and the Quinby tube. If, however, a stillett tube is equally efficient, I regard it as simpler and requiring less skill than the use of introducer or speculum. The general surgeon should be prepared at least to intubate with a stilletted catheter. The trained anaesthetist should be familiar also with the introducer and the Jackson speculum.

I present, therefore, the following conclusions for your discussion.

Intratracheal anosthesia is a safe method; it is the anosthesia of choice in operations about the head and neck and thorax. The mortality from such operations should be reduced by the use of intratracheal ether.

There is no contraindication at present to its employment in any surgical operation

There are sufficient reasons for stating that operative shock is diminished and that the post-operative recovery is rendered less exhausting in all operations.

All recorded forms of apparatus and the several methods of intubation are successful and require but little technical skill for their employment

Nort:—I have not mentioned the names of the surgeons and anesthetists who contributed to the data upon which this paper is based, because in trequesting them to answer the questions of the circular letter I indicated my intention to omit the names of clinics and of individuals. Nevertheless I would express my sincere graitfule to these men for their contributions to this series of cause and for their courtesy in responding so promptly to my inquiries.

SEMINAL CALCULI SIMULATING NEPHROLITHIASIS

BY C. S. JAMES, M. D., AND J W. SHUMAN, M. D., CENTERVILLE, IONA

"HAT calculi of the seminal vesicles is a rare condition, is evidenced in a personal communication from Eugene Fuller, who has performed not less than two hundred and forty vesiculotomies states, "stone in the seminal vesicles must be very rare," and cites having met with but two cases in his experience, and one of those not definite.

Belfield (personal communication) states. "that organic concretions with lime salts, not exceeding buckshot in size, are not uncommon in the vesicles, and that he has encountered them in two cases of vesiculotomy " Furthermore, he states, "that concretions exceeding that size are quite an unusual occurrence' And again (J' Am M Ass., lm, No 26), "the intimate relation between the juxtavesical ureter and the seminal duct seems, therefore, responsible for considerable kidney and ureteral disease hitherto unexplored Renal pain, 'lumbago' or 'nephralgia,' often occurs when the vesicle is distended "

Disque, of Pittsburgh (personal communication), reports having seen no cases with operative or post-mortem proof, but refers to cases of vesiculitis simulating to some

extent renal calculi P I McHught makes reference to concre tions or calcula sometimes occurring in the vesicles of the aged, the only symptom referable to them being colic, and this infrequent Reliquet first described this symptom, in 1870, as spermatic colic occurring at the time of an ejaculation The pain, he states, is felt at the neck of the bladder, radiates upwards or down to the testicle, is sharp, and, reflexly, may produce nausea The pain is due to the obstruction of the duct by a concretion of inspissated semen, and, as a result of the obstruction, the emission may be deficient or fail altogether, in which case, the colic may endure for a few minutes

Casper 2 gives the best description, describing as a rare case seminal calculi growing as

large as a cherry stone so that they may completely occlude the ejaculatory duct, Their number may be numerous supposed their formation to be due to stagnation of secretion in the vesicles, occurring in advanced age, though it may take place at an early period in life when inflammatory processes have narrowed the lumen of the ejaculatory duct, so that there is an impediment to the outflow of semen.

The calculi give rise, not infrequently, to pain upon micturition and defecation. In a case where there is suspicion of seminal calculi. an attempt should be made to palpate the vesicles

Keen states that calculi of the seminal vesicles are usually only found post-mortem, often give rise to no symptoms, are as a rule soft and easily crushed between a sound in the bladder and finger in the rectum

Tuholske states that inflammatory diseases of the seminal vesicles are undoubtedly of frequent occurrence Their close proximity and connection with the prostate makes posterior urethritis a prolific cause of vesiculitis which is most often mistaken for prostatitis, the chief symptoms being pain referred to the peritoneum, the groin the lower rectum, and the lumbar region associated with defecation, and painful and

frequent micturition Zeissel holds that "there is one symptom indicative of inflammation of the seminal vesicles, viz, erections which are almost constant and so painful as to constitute prianism With the urine, blood and sometimes pus are evacuated, and seminal fluid even pes at stool " Examination per rectum reveals two clongated swellings by the side of the prostate running upward and outward at the base of the bladder This inflammation may terminate in pus formation or peritonitis, or becoming chronic terminate in atrophy or permanent dilatation with the formation of concretions

[&]quot;Keen's Surgery " re Cleternational Text Book of Surgery u

Henry Morris! briefly mentions that tubercles, abscesses and stones in these organs may give rise to symptoms which resemble

those of renal calculus. That calculi in the seminal vesicles may present the definite clinical picture of renal stone may be satisfactorily explained by an exhaustive study of the nerve supply, which, summed up, may be briefly stated as follows. Irritation from seminal calcult can be transmitted to the respective kidney or lumbar region through, first, either the vesicle or prostatic filament of the inferior hypogastric or pelvic plexus to the hypogastric plexus, hence through the gangliated cord to the lumbar ganglia and either to the lumbar vertebræ and their ligaments (lumbago), or on through the aortic plexus, aortic-renal ganglia and renal plexus to the kidney sub stance (nephralgia), second, can be transmitted through the deferentia plexus via short route to the gangliated cord, third the efferent filaments of the deferentia plexus and the genitocrural nerve to the lumbar region, fourth, irritation may travel through the vas deferens filament of the pelvic sympathetic, the spermatic artery filament of the spermatic plexus and its numerous filaments to the renal or lumbar ganglia Thus may be produced, by any one of the several routes, referred pain and tenderness

A thorough investigation of this subject both by literature reference and personal communications, has failed to procure any operative or post-mortem proven cases to

report other than the following

Case 1639, Mr. T. E., aged 33 married four years, one child living and well. No children dead. Tires examined October 6, 1910, and found suffering from apparent right renal colic as evidenced by severe right-sided pain, rectus rightly, frequent meturn tion, pain referred to penis and marked pain on palpation of the right kidney.

Urnary examination Chemically negative, microscopically, few crythrocytes epithelium and phosphates Case diagnosed as probable right renal calcult and yielded to usual hypo of morphin. Two days later, the patient passed by urethra what he described as a "sing," which was a blood-covered irregular calculus about the size of a grain of field corn.

Physical examination at the time revealed a tender right kidney on palpation Labor or forced exsurgical Diseases of Kidneys and Ureter, vol. is

ercise excited pain in the right flank Patient

cusphatically denied specific history. Rectal examination evidenced a firm, non-painful prostate, the vesicles not palpated l'attent returned to his work, but complianted of continued discomfort and pain in his right side all summer; when, on November 10, 1911, he again consulted and physical craimation evidenced the same findings as before

Blood examination, W. B. C., 7600; R. B. C., picture normal. Ha moglobin 80 blood pressure 110

Nephrotomy advised and accepted

November 11, 1911, under ether anasthesia, through a lumbar incision, the right kidney was sectioned and no stone present. Ureter patulous Incision closed and the kidney drained by a sutured crearctte drain Convalescence uneventful until removal of drain on seventh day, following which urine became bloody, patient later passing vermifurm clots from the bladder. Urine stained out many gram negative diplococci intra and extra cellular and then it was, upon direct questioning, ascertained that the patient had suffered from gonorrhoral infection fourteen years previous, with a right sided orchitis Urine was thoroughly worked out per antiformin method, no tuberele bacillus found General condition continued to grow worse due to the acute hæmorrhagic anæmia and cystic tenesmus due to blood clots contained therein

Blood examination fixmoglobin 30, R B C, 3 200,000, W B C, 10 000 Polkilocytosis and a

marked aniscytosis

Datb December 16, 1911, clinically from acute anzmia due to hemorrhage from the right lidney, Autoray December 16, 1911, by Dr J Walder and L Walder

Seminal vesical walls hypertrophicd Four calculi removed from the right vesicle, situated near the fundus dull white in color and faceted, ranging in size from that of a grain of popcorn to that of field com. Seminal fluid stained out many grain field com.

need corn Seminal fluid stained out many gram negative diplococei

Chemical analysis of calculiyielded phosphate and

carbonate of lime 85 per cent, organic matter in which spermatozoa were found 25 per cent

Pathological diagnosis

 l'ernicious anæmia secondary to hæmorrhage.
 Suppurative hæmorrhagic nephritis of the right kidney

3 Chronic seminal vesiculitis with calculi for-

4 Chronic Neisserian infection

RESULTS OF THE RADICAL ABDOMINAL OPERATION FOR CANCER OF THE UTERINE CERVIX¹

REPORT OF 25 CASES

BY JOHN A. SAMPSON, M. D., ALBANY, NEW YORK

Y early experience with this operation was while resident gynecologist at the Johns Hopkins Hopkins Hopkins, the and the cases which I operated upon there through Dr. Kelly's courtecy belong to the records of his clinic and are not included in this report.

Since leaving Baltimore in the spring of 1005. I have operated upon twenty-tive patients for cancer of the cervix, by the radical abdominal operation Some of the pelvic lymph nodes were removed at twelve operations, and these were examined microsconically in all but one instance-unfortunately a node from one case, which in the gross apparently contained cancer, was lost. Metastases were found in one or more nodes in seven of the twelve cases (eight, if the one lost is counted as positive) We therefore know that at least seven of the twenty-five patients had metastases in one or more of the pelvic lymph nodes at the time of operation

Five died as the result of the operation, and four of these were advanced cases in one (Fig. 1), the trigonum of the bladder and lower ends of both ureters (double ureter on one side) were resected, in another, a portion of the right external iliac vein was excised for the extension of cancer about it from a metastasis in an iliac lymph node (similar to the condition shown in I'm a), in another, several large cancerous lymph nodes, including a large lumbar node, were removed; in another, a portion of the bladder was excised The fifth was less extensive than the above. but the patient was in feeble condition One of the five patients died a few hours after the operation, and the other four died from four to seven days afterwards All five apparently never completely rallied from the shock of the operation. In my experience, the opera-

tion in the favorable cases is attended with a very low primary mortality (in fact, I have not yet had a fatality in this group). The high primary mortality has occurred in the "border line" and the advanced cases, where the growth is more extensive, requiring a more difficult operation, and the resistance of the nationt is lower than in the early cases. This would emphasize the importance of not operating on the latter patients, were it not for the fact that some of them do survive the operation and may be relieved for a time, and even occasionally cured With experience we will learn to discriminate what patients should not be operated upon. It is very hard for me to refuse to operate on an unfavorable case if I believe I can remove the entire growth, and it is also difficult to stop during the operation until I think I have. Only one Instance of ureteral fistula occurred, from interference with the blood supply of the ureter, in the twenty patients surviving the operation, and this closed spontaneously. By leaving the ureter attached to the peritoneum above the base of the broad ligament and freeing the parametrial portion carefully from its sheath, the dangers of necrosis are slight 2

THE END RESULTS (FIVE YEARS' LIMIT)

Eight of the thenty-five patients were operated upon over five years ago. Two of these died as the result of the operation, and two died later from recurrence. Four are clinically free from cancer at the present time, i.e., four of eight cases operated upon and of six surviving the operation.

The Two Cases Dying from Recurrence.

Both were young women, aged 30 and 32

years, who had never had children. Both

ib of the discussion of this phase of the subject see Johns Hopkins Hoperapetal Bull, April, 1904, and J. Am. M. Am., Sept. 10, 2004

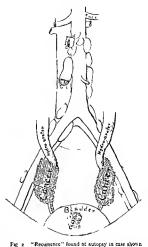
Read before the American Gymecological Society, May 10, 1011



Fig. 1. Wanneed cancer of the creaty, sweeting type anning suthant the cervit. Photograph of a stand (hamstorylin and cosin) median signital section of the anning time to the control of the cost of

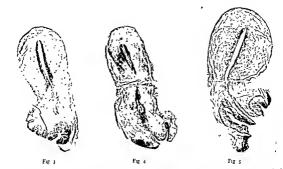
presented the same type of growth, namely, the inverting type ansing from the portio vaginalis (Figs. 2 and 3). Both appeared favorable before the operation the uterus was freely movable, and the parametrium was apparently free. Pelvic lymph nodes were not removed in the first one. In the second, small parametrial lymph nodes were removed and found to contain cancer.¹ The Iliac

¹For discussion of this phase of the subject ere previous article by the Pariscipation of the Tissors A fiscent to the Licrus and of the Prisk Lighty and the Prisk Timber 1 and 1



in It is 1/4 satural suc). The lymph notes shown were all studed moreoperally, and measures sere found in two abdominal lymph nodes as indicated. Both meters were compressed by cancer just below where they cross the lines vessels, from the extremond of metastases in the lines which the contract of the

nodes were not removed The first one was apparently free from cancer for two years, and died from recurrence a year later. The second died within a year of the operation The cause of death in each was the same, i e., renal insufficiency from compression of the ureters by cancer. The symptoms were persistent nausea and vomiting with great loss in weight and strength. An autopsy was obtained in both cases. In the first, there was not any evidence of cancer found in the field of



Lig. 3. Apparent early cancer of the cervit inscring type, aroung from the portion signals. Photograph of stanced (Lamanovith and cross) medium agriculture factors of the strenge featured size (Compare with Fig. 7 Extent deed there years after operation from "recurrence," in this instance from metastases in pelve lymph nodes not removed at operation. The parameterium, chinacily and microscopically, was free from ensure, and the growth was apparently limited to the cervix. The operation in this group is attended with a los primary mortality (I have not to a single case). Unfortunately of definite proposes cannot be given, each which the information from the first of the comparent of the protection of the effects objected the protection and seed in medium such as followed the control for the portion signals:

defined internatory in and comprision fee ext. and next liketratoral. The uterus was fixed in the pels by address tubes and ovaries, but the parameters fee extent was from cancer from the person fee extensive such and ovaries, but the parameters from the form cancer from the other hand, metastases were found in small garanterial jumph nodes. The laboratory findings gave an unfavorable prognomes and the person of the critical section of the critical section from the north prognomes.

By Applicate "boddeline" cancer of the cervix, meeting type, ansign from the portion satisfials. Professing the cancer of the cervix meeting type, and the second satisfials are professing to the second chamitory has an access) median assigntial section of the setter (internally inter from cancer, nerthy seven years since the operation. By comparing with Fig. 3 it can be seen that the primary growth is some extensive. Whate the primare transition of this insure failed to detect any direct extension of the growth from the cervical insure or mutatives in the small permitter in lymph and the profession of the small permitted in the small p

operation, but the ureters were compressed by cancer, just below the place where they cross the iliac vessels, from the extension of metastases in the like lymph nodes Metastases were also found in two of the abdominal lymph nodes The patient died from cancer in accessible line lymph nodes not removed at operation In the second, a similar condition was found, and in addition a small recurrence in the field of operation between the bladder and vagina (Fig. 4)

The Four Cases Who Are Apparently

No 1 Face, aged 46, operated upon in August, togo The patient had been curreted a month before I saw her, and her condition had later been diagnosed as "Importable" by another surgeon and the parameters of the surgeon and the parameters of the surgeon and the parameters in the surgeon and cancer was found in one. The type of growth was meeting, astissay from the porton vaganals, (Fig. 5), and the surgeon and the parameters of the surgeon and the surgeon and

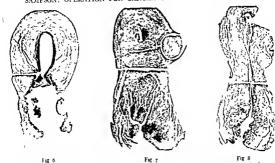


Fig 6 "Border line" cancer of the cervit inverting type, arising within the cervix Photograph of a stained (harmatox) in and cosin) median signitial section of the uterus (natural size) Compare with Figs 1 and 8 Patient clinically free from cancer nearly seven years since the operation. Before operation the certical canal was found to hat e been converted into a thin shell lined with necrotic cancerous tissue, and its movements nere restricted cert it was torn in removing the uterus and the field of operation infected with fragments of cancer See text, Case No a of those apparently cured Microscopically, cancer was not detected in the parametrum laterally but had extended through the anterior wall of the cervit and bad invaded the posterior wall of the bladder a portion of which was removed with the cervix. My primary mortality in this group of cases has been about 20 per cent, and yet some of these may be cured Border line cancer of the cervix, inverting type, arising within the cervix Photograph of a stained

(hermatory in and coun) median sagittal section of the uterus (natural size) Compare nith Fig. 1 and 8 Patient clinically free from cancer, nearly set years since the operation. The growth appeared extensis e before the operation and introceoptedly it had extended beyond the cervit and invaded the parametrium slightly on each side. A small myoma is situated in the antenor uterine wall. See text, Case No. 3 of those apparently cured. Fig. 8. Early cancer of the cervit, inverting type, arising which the cervit. Photograph of stained (harmatory in

and cosin) median sagittal section of the uterus (natural size) Compare with I ig r Patient clinically free from cancer and count into adjust a crise to the union of polyro is studied in the fundus and a small myoma in the anterior uterine wall

diagnosis of "inoperability," and metastasis found in an iliac lymph node, the patient is clinically free from cancer at the present time, 1 e , nearly seven years since the operation

Vullipara aged 40, also operated upon in 1005 Before operation the primary growth appeared extensive, the cervix having been converted into a thin shell and its movements were restricted \t operation the cervix was found to be adherent to the bladder, and in attempting to free the bladder the cervix was torn, the field of operation infected with the necrotic cancerous material, and the specimen removed in fragments. The case was considered unfavorable, and no attempt was made to remove the pelvic lymphatics type of growth was inverting, arising within the cervix (Fig 6). In spite of an extensive priroary growth, its removal in fragments, and the infection of the field of operation with cancer her physician. Dr C G McMullen of Schencetady, informs me that she is apparently cured

No 3 Para, aged 43, operated upon in 1906 Before operation the primary growth appeared extensive, though confined to the cervix lymph nodes were not removed. The type of growth was inverting, apparently arising just within the cerucal canal (Fig. 7)

No 4 Para, aged 53 Both tubes and ovaries had been removed five years before for pelvic inflammatory conditions, operated upon by me in April, 1907 Before operation the growth was apparently restricted to the cervix, the uterus was fixed (due to adhesions), causing a diagnosis of "inoperability" to be made by the surgeon who had first operated upon her Pelvic lymph nodes were not removed The type of growth was inverting arising within the cervix (Fig. 8)

The two patients dying from recurrence were both young women, with an average age of 31 years, who had never had children The type of growth was inverting, arising

from the portio vaginalis, and the cases appeared favorable before the operation; and both died from extension of metastasis in accessible iliac lymph nodes (a small recurrence in field of operation was present in one). The four apparently free from cancer tive years or more since the operation (two nearly 7 years) were older women, average age 45+ years; three had borne children, the other had not. The type of growth in three was inverting, arising within the cervix, and inverting, arising from the portio vaginals. Three of the four appeared unfavorable before the operation. In only one were the accessible pelvic lymph nodes removed, and cancer was found in one of these.

These cases are too few in number from which to draw any definite conclusion, but they show that what appear to be unlawrable cases may sometimes be cured, and that it is not safe to give a favarable promotis in an apparently early case. With further experience, we will learn on what to base our prognosis, such as the origin of the growth—whether from the portio vaginalis or within the cervit, it type inverting or everting, its histological structure, the age of patient whether parts or mullipare, etc.

I have had the opportunity to obtain autopies on five patients dying from recurrence (including the two just reported). In three, the immediate cause of death arose from the compression of the verters by cancer extending from metastases in accessible illae highly not because the contraction of the verter by cancer extending from metastases in accessible illae highly not because the field of operation from cancer not removed at operation (an advanced case). In the fifth, there was an extensive local recurrence filling the pelvis with metastases to the lungs, heart, one kidney, and skin

Based on my own experience, I believe that metastases are pre-cent in from one third to one half of the operable cases and that while I) mph nodes which are not readily accessible may be involved as well as accessible ones, the latter are the one-which are most frequently involved, and sometimes the only ones, and I refer especially to the liliac I) mph nodes near the origin of the internal filiac vessels. I therefore believe that these nodes should be removed when the condition of the patient will permit, and especially in the early cases where the operative technique is easy and the resistance of the natient is unusually easy.

SKIAGRAPHIC DEMONSTRATION OF VESICAL TUMORS

BY HOW AND A LITTY MED. AND ROBERT M. LEWIS M. D., BALTHORE

A Sarule tumors of the bladder offer as httle resistance to the passage of the X-rays as the surrounding healthy normal tissues; consequently, no matter how large the tumor, a skiagram made of the unprepared bladder with its contained growth will show neither bladder nr tumor If the bladder is hilled with air, either by catheter in the knee-breast posture, and a radiogram is then taken, the resulting picture will show perfectly the outline of the bladder, but as the tumor offers approximately the same resistance to the X-rays as the surrounding tissues, it will not register on the plate

Were we ignorant of this how puzzling it might be, first, cystoscopically to demonstrate the tumor, and then to take an X-ray picture and to show a normal bladder outline with no grow ht visible. Under such circumstances one would almost be tempted to make a diagnosis of "phantom tumor of the bladder"

It is then evident that some foreign medium must be introduced into the bladder to throw the tumor into relief if it is to be seen at all In the first case we show here this has actualby been done. The condition—a pipilloma of the bladder—was recognized cystosoptically. A suspension was then made of bismuth submittate with gum transcenth and



1.6

water This was shaken up and rapidly run into the bladder Fortunately, as later shown, the suspension, which is never perfect, was in this instance a poor one, and the bismuth salt rapidly precipitated. The radiogram was then taken at once

Looking now at the illustration we discern three well-defined areas, A B, and C The area A represents a conformerate of large growths, showing beautifully the papilloma tous nature by the cauliflower like outlines. The bismuth has evidently settled apart from the mixture, filtering into the crevices and the interstices in the surface of the growths, bringing out their characteristic details with astoniching clarity. The tumor mass is separable into three divisions, and more than half fills the bladder in its present state of distention. Note especially that, good as the picture is, a very important detail the size and situation of the pedicle, is left undetermined. About the tumor is seen a dark zone (IB), which evidently represents the injected bramuth suspension. Above this, the gray area (C) is probably the result of the presence of a small amount of urine, water, or air which has accidentally leaked in. A little bismuth has addreed to the apex of the bladder and causes the dark shadow seen there

In the second case, the diagnosis of papilloma of the bladder was again established by



Fig

cystoscopy. Instead of using bismuth sus pension in this case, the bladder was injected with 40 cc. of a 5 per cent strength silver iodide emulsion. About half the amount in sected was then voided. In doing this the patient experienced considerable difficulty as. the tumor directly overhung the internal urethral orifice and, dropping upon it, acted as a ball valve and checked the flow Part of the silver solution being expelled with the patient still in the dorsal position, the bladder was next distended with air, using a stringe bulb attached to the catheter for that purpose Here, again, some little difficulty was encountered, as the air tended to leak out around the catheter By holding the parts together,

however, most of the air was retained Ti

The second radiogram also shows three zones, even more distinctly defined than in the previous petture. The large tumor (A) is sharply defined, the growth being, of course, sightly exaggerated. It must be remembered that the size of the shadows in all radiograms depends on two factors, the size of the object taken and the relative positions of plate, object, and N-ray tube. We can, by taking stereoscopic radiograms following Dr. Manges' method of pelvic measurement, determine with accuracy the size of the tumor.

Here we call attention to the fact that the second picture does not give the irregular and rough outline of the body of the papilloma so well as the first. The reason for this will be Notice that a large amount discussed later of encircling healthy bladder wall is shown From the X-ray taken without distention and the media used, or from the cystoscopic picture, in the case of so large a tumor one naturally concludes that the greater part of the bladder wall is involved by the growth Here though the tumor is large, one can al most surely say that the only part of the bladder wall involved is that part to which the pedicle is seen attached Plainly no growths are present outside the area covered by the tumor We may pretty safely conclude, too, that no other growths of any conaderable size springing from separate bases are concealed by the massive growth shown for were this the case we would almost certainly be able to see at least a small part of the secondary growth jutting out from behind the margin of the large tumor

Although the picture under consideration does not show the roughness of the surface characteristic of papilloma, there is a most important point not brought out in l'late I, but extremely well shown in the second i e, the pedicle (P) of the growth, which is here well defined and comparatively small, being about 1½ cm in diameter. Its size and situation. were later proved by a direct method of measurement A small hooked instrument was passed through the open cystoscope until it touched the posterior vesical wall. The point on this corresponding with the external orifice was carefully noted The instrument was then withdrawn until the hook pressed against the surface of the pedicle farthest from the urethra The handle of the instrument was then measured from the point previously determined to the point now found opposite the shoulder of the cystoscope, and this measurement was, of course, the distance of the pedicle from the posterior bladder wall. Making a note of the last point determined on the handle of the instrument, the hook was disengaged from the pedicle, withdrawn slightly, and then pressed against its anterior surface. The distance hetween the point on the handle previously noted and the point found opposite the outlet of the cystoscope was 11/2

cm, the measurement of the diameter of the pedicle

The dark shadow B surrounding the tunior represents the silver iodide emulsion left in the bladder. The light zone about this in turn is the injected air distending the bladder. In the second case considered, the clear demonstration of the pedicle is most valuable, and is probably due to the fact that a solution of very high specific gravity was employed. This floated the tumor away from the bladder wall and surrounded it everywhere except at the set of attachment.

In this case it was remarked that the characteristic irregular outline of the papilloma was not demonstrated, this undoubtedly resulting from the thickness and viscuilty of the silver todide solution, which prevented its penetration into the interstices in the surface of the growth. It must be added that direct inspection showed the surface of this tumor not to be as irregular as in the other instance, this fact alone, however, would not account for the lack of detail shown. This case (No. 2) is at present under treatment with the high frequency current. In spite of the large size of the growth three treatments have almost eraddicated it.

To bring out both surface detail and pedicle in our next case, we propose to combine the method, just described, first, injecting into the bladder a bismuth emulsion, or better perhaps, a simple suspension of bismuth subnitrate in water without tragacanth, allowing this to precipitate and coat the tumor, then letting the patient oid as much of the solution as possible. The next step will include the mjection of 30 cc of a 5 per cent emulsion of silver iodide, which should float up the tumor and surround the pedicle; and finally, unfation of the bladder with air, as described in Case 2.

A point not previously alluded to is the obvious bearing of the posture of the patient on the position of the tumor. Evidently, if the pedicle is attached to one side of the hadder, leaning in the opposite direction will cause the growth to drop away from the vesical wall to which it is attached, increasing the likelihood of its being surrounded by the fluid injected.

Unfortunately, irritation of the bladder is the rule, especially in the case of vesical tumors of large size. Much discomfort and distress to the patient may be avoided by instilling a 4 per cent solution of novecting and allowing it to remain in the bladder for ten minutes before beginning the necessary manipulations.

The foregoing description might lead to the supposition that much time must necessarily be consumed in performing the steps recommended. This, however, is not the case, a very few minutes sufficing for the entire procedure

We would add in conclusion that ne are now trying out various preparations of silver iodide for N-ray purposes in vesical, uneteral, and kidney work. We have an unusually good radiogram of the renal pelvis and ureter injected with 5 per cent silver iodide emulsion in a case of unetrard aclauding.

The excellent radiograms were taken by H

II Hart

GENERAL PLASTIC PERITONITIS

WITH REPORT OF A CASE

BY WILLIAM R. CLEBANS, M. D. AND R. J. WIRVIE, M. D., CHERED

I LNRI / aged 37, male married, occupation salconkeeper Referred In Dr W J Mar vel Diagnosts, obstruction of bowel, problem upon

Previous illness. Denied in 10to all possibility of ever having been ill previously, either with pains in the belly or anywhere else. Claims that he does not drink except very moderately. Veneed his

tory denied but no Wassermann revision was made been needs up to lagant to have a toolsky pain in the left node of the abdomen, which radiated to ward the right which and was freequently serve, radiated the nased. The pain was accompanied by nasseas and committed needs. After a short while the exact period of time is in doubt by he legan to notice the swelling of the abdomen, but did not remember that there was no special change or any special destination of one spot

Appetite has been fair when he has not been in one of the attacks. Has not noticed any particular food or action that would be likely to bring on an attack. Bowels have been regular and no blood or other abnormality noticed.

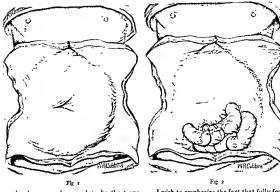
Utine normal in frequency and general character No pain or difficulty at any time. Chemical and

microscopical examinations negative. Physical examination. Thin and rather sallon looking skin dry and those, thur dry and thin, chest normal to our examination, marked abdominal distention. Cardiac area displaced upward but heart regular in rate and rhythm. Sounds normal

The distended abdomen presented a V shaped mass, which extended from the left his pochondrium downward and inward to the pulsa and then upward to a point between the ambitious and the antenor superior spine of the him. The walls were wiense that only the fact that there was a vasily distended bowel present could be made out — the angulation, however, bring distinct. It was slightly tender, but nothing marked. There was no sign of fluid and

Without delay the abdomen was opaned, the incision being made to the left of the me-than line and a large, sausage-shaped tumor was found which began under the left hypothendrum at the iduodeno-jejunal angle and passed outwards then downwards, forwards and inwards to the pubs and up after an acute angulation at lowest point to a point midwab between the anterior superior spine of fitum and navel, where it disappeared into the poterior abdominal wall.

There was no fluid, no small bonels, no colon nor omentum visible. The large blood vessels on the surface of the spinal column were distinct explaidad to the tumor mass. The upper portion of the abdomen was cut off from this area by a membrane, which extended from the posterior to the anterior wall. This membrane, which was similar to that covering the other parts of the cavity exposed, was clear and of a hyaloid character.



and, when opened, proved to be the transverse colon and the omentum, which was firmly adherent to the anterior abdominal wall.

We then began to try and separate this membrane at the lower portion of the tumor mass and found that it would peel off in large flakes and leave the small intestine and one inch of mesentery free and of normal size free about six inches of this membrane would loosen up from two to four feet of small bowel. which was laid together in a manner similar to the plaits of a dress (Fig. 2), but, of course, in a rather irregular formation. This membrane was not so firmly adherent to the intestine as it was to the mesentery, except on the distal side, where the bowel had been the most distended At these points (Fig 2) of contact there would be bleeding from the bowel surface and there would also be bleeding from the mesenteric surface, if this membrane was detached from it. It is very essential to emphasize the firm attachment of this membrane to the markedly thickened mesentery, in order to prevent some from thinking it might be a retroperitoneal hernia.

I wish to emphasize the fact that fully fourfifths of the uncovered bowel was covered by almost normal peritoneum, being a little granular, except from the points of pressure, where it was tagged and bled I did not attempt a complete removal of the membrane from the mesentery, as it was not necessary and would only increase an already tedious operation. The liberation of a spot in the lower ileum finally removed the obstruction and the gas, etc., passed into the large bowel.

By this time we had the small bowel freed from the membrane down beyond the ruffling of the mesentery and turned our atten-

tion to the colon and sigmoid.

This large bowel was in normal position behind a tense membrane, continuous with the membrane opened above in the transverse mesocolon, which extended from the front of the spinal column to the sides of the abdomen in such a manner as to obliterate the normal depression occurring in this area (Fig. 1). However, the membrane here was much more firmly attached to the peritoneum, and it could not be torn without opening into the retroperioncel flat or onto

the surface of the colon, cæcum, or sigmoid, which were firmly pressed into the fossa renalis by this membrane.

Another point of value here is to say that bere the peritoneum was not puckered or folded, but tense, like the membrane covering it. This in distinction to the membrane covering the small bowel, which might be accounted for by the fact that the small bowel was more active and kept itself somewhat free.

No attempt was made to open farther into the upper part of the abdominal cavity, as we felt that quite enough to obtain at least temporary relief had been done and later, if necessary, more could be freed

The man made a slow but fairly good recovery and seemed to be going towards permanent health when he was taken with tuberculosis of the lungs and died, about nime months after the operation, and about iree months after his pulmonary phthisis was noticed Much to our disappointment, no post-mortem examination was permitted.

In the hurry of the operation and getting the man to bed, the small specimens of membrane were lost and consequently no microscopic examinations were made, but I felt that the case was worthy of mention, in spite of the fact that it leaves a cloudy etiology and an imperfect diagnosis

When one begins the study of a case of this type, he is immediately struck with the paucity of literature that bears directly upon the case Probably the best article is that of Albert G Nicholis, of Montreal, who has described cases on the same order in an article called "Some Rate Forms of Chronic Peritonitis" He makes a classification after this manner

Chronic Hypertrophic Pentomtis
Sporadic Diffuse,

Simple Tubercular, Simple TB C. Carcinoma. Under this classification he brings such medical novelties as Curschman's Zuckergussleber, and also all the small local areas which are of appreciable thickness, and present the clear hyaloid appearance with which we are familiar as they occur upon the surface of the liver and spleen insidious diffuse cases which he describes have been associated with ascites, which was absent in this case. The cases cited by him from the German are subsequent to injuries and all complicated with ascites.

This brings the discussion into a wider field, that is, Does the ascites of a chronic heart or liver lesion excite the peritonitis that occurs in those cases, or does the peritonitis cause the ascites? This must be left to others, with the fact presented here, that we bave a diffuse hyaloid membrane, covering the entire pertoneum, yet with only a normal amount of deat.

Here it is necessary for us to mention that class of cases which is spoken of as a polyserositis, and which is beautifully described by A. O. J. Kelly. In these we have a multiple involvement of the serous membrane with adhesive pericarditis, pleuritis, and peritonitis, the origin of which change arises in about one half the cases in the upper abdomen, in about one-half of the remainder in the pleura and pericardium, which leaves one-fourth, the origin of which is unknown. In these cases the peritonitis, as a rule, is most marked in the upper part of the abdomen, where one-balf the lesions begin This also brings into the discussion the so-called pericarditis pseudocirrhosis of Pick, which is nearly always associated with ascites.

As to what part tuberculosis may play in this condition, there is great doubt, but it has been shown that with a bacillus of low virulence the tubercular lesion may be constructive more than destructive, and while the caseous nodules may be absent, there will be a hyaloid membrane relatively avascular that resembles the one I have described. The question as to whether the mild attack of the bovine tubercle bacillus would be the most likely to cause this type of peritonitis will need also to be discussed.

The next point in relation to this case and tuberculosis is whether it would be possible to have a tubercular membrane of the extent this was without its being firmly attached to the bowel at all points

This byaloid type of peritonitis may also complicate a carcinoma which has periorated the walls of one of the hollow viscera. This combination of inflammation and neoplasia Nicholls says would exactly reproduce the picture of a hyperplastic peritonitis. The development of a membrane over any foreign body in the peritoneal cavity has been in vestigated by a great many and at present we are told that the fibrin is thrown over the mass and appears in parallel fibers; that this fibrin later becomes fibrous tissue and covered with endotbelial cells. It is also said that the fibrin deposit nearest related to the endothelial covering is the first to assume a fibrous character. It has been shown by some investigators that when the streptococcus or colon bacillus is present, we have a granular fibrin which does not tend to form permanent adhesions, while, should the fibrin exudate be caused by a pneumococcus or gonococcus, it is striated and organizes into permanent adbesions. This I do not believe will be justified by later investigators. However, it serves to suggest to us that perhaps this man may have suffered an infection with the colon bacillus, causing a diffuse infection and later the organization of this byaloid membrane.

But to return to the fact that this man died of a nulmonary tuberculosis makes us wonder about the possibility of his having had a tubercular polyserositis of a mild type, which, after the weakening strain of an obstructed bowel and subsequent operation, was enabled to become more virulent and obtain a pulmonary footing, in this way closing the picture

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THE RELATION BETWEEN SARCOMA AND MYOMA OF THE UTERUS AND ITS BEARING ON X-RAY THERAPY OF UTERINE MYOMATA 1

BY JAMES RAGLAND MILLER, M D

INCE the advent of the X-ray treatment of myoma of the uterus, the clinical importance of uterus sarcoma has greatly increased. In the early days of the operative treatment of myoma, when enucleation, castration, and other conservative procedures were carried out, the question of the frequency of sarcoma accompanying myoma was much discussed by Fehling, von Ott, and others At that time, Winter came to the conclusion that operation was not indicated through fear of sarcoma. for the primary operative mortality was much over 6 per cent, and he could claim only 4 per cent occurrence for sarcoma.

The discussion of this subject was quiescent during the time when the total extirpation of the uterus was the operation of choice in treating nearly all myomata. At present, however, the opponents of the X-ray therapy particularly have revived the question, and paint very black pictures of the heavy responsibility that the X-ray therapeutists take upon themselves, the most extreme opponents go so far as to warn against the X-ray therapy, because a sarcoma might thereby be overlooked These authors, you Herff, Waldhardt, and others, probably reason along the following lines:

Every woman with sarcoma of the uterus who is subjected to the X-ray treatment is lost; every woman, or at least most of these women, if treated by operation, can be saved.

The X-ray therapeutist can, however, bring up the following points for consideration:

Table I	Occurrence of		
Author	Myoma	Sarcoma	Per cent
Bosso	105	6	5 7
Fehling .	400	8	1.8
Holmeier	578	21	10
Winter	753	27	3 5
Waltbardi	03	- 1	33
v Gurlt	883	;	23
Geislet	258	8	28
Hauber	138	3	11
Barnomo	.30	3	3.3
Warnel	130	3	25
Pinard	68	i	4 2
Haultain	120	,	
Henkel	140	1	17
Snegnireff	8,	5	6 3
Evelt		ì	
Nobel (rollected)1	1301	31	2 1
Torkel		10	1 2
Meslay and Hyenne	313	2	3 2
Martin			5
Essen Muller	205	0	3
Kelly and Culle	503	•	ō
Schottländer	1400	17	
Flerchmann	355		3 3
Franki	385	7	1.3
	216	ŧ	14
Bumm	500	4	2 .
Hertel	468	13	a 8
	_		
Total	9750	192 (2ver	32e)1 96
Collected stanstics by			
Lewis	\$218	22	1.4
Olshausen	6470	77	1.2
1280 cases of McDonald	with a surround	a and Include	d tastorer

1280 cases of McDonald with 3 surromate and included temporar cases;

*Contains 1000 cases of Planarosist, evidently only surrogations

First Is sarcoma so common in connection with myoma as the opponents of the X-ray

Second Is sarcoma really so difficult to

diagnose?

Third. Are sarcoma patients really cured.

under the operative treatment?

Fourth Is it not also possible to cure, or at least to check the growth of sarcoma by

means of X-rays? It is not yet possible to give a final answer to this last question, because the cases treated with X-rays are by no means so numerous as those treated by operation, and the period of observation is still too short Some of the questions can, however, be answered by means of a sludy of the literature and of the experience up to the present time with the operative treatment Such a review of the literature has not yet been made undertaken to do it in the following pages, and at the close I shall report the experience of the Freiburg Frauenklinik in relation to this subject

Table II. Radical Myomectomics Number of Operator Cases Death Sarney (collected) 2450 It: Biermet (Torkel) 180 13 Aleinhaus (Garkisch) 202 ıŏ Grucciardi 367 20 Схетрия 36 ٥ Franz 235 2 Essen-Möller 205 6 Fintsch (Grell) 272 41 v. Franque 155 Kiparsky oóo 41 Martin 134 10 Scharlieb 100 2 Schottelius 127 5 Pawhk (Pithal 143 Tauffer 164 23 Thorn 175 Walthardt 98 lordan 70 2 Larczewsky 48 3 s Winckel 67 Dilderlean 4 Flatau 001 n

The questions which I shall try to answer by means of the study of the literature are as

6646 324-4 87%

- follows

 1 What percentage of myomata are found
 to be sarromatous?
- to be sarcomatous?

 2 What is the primary operative mortality
- of the radical my oma operation?

 3 What is the primary operative mortality
 in sarcoma cases? What is the percentage
- cured?

 4 What per cent of sarcomata can be diagnosed? That is, if they all come to us in consultation, what per cent should we not treat with X-rays?
- I To answer the first question, I have taken from the literature figures which present reports of continuous series of cases among which the search for sarcoma was made. The results can be seen in Table I

The geographical distribution of sistems may be of some importance, but I believe the variability, and particularly the extreme difficulty of the microscopic diagnosis in the individual caces, to the chaef causes for the great differences in figures Winter chains to have found 4 per cent surcona among 700 myouna cases Pfannenstid, on the chaef causes for a single property of the figures given in the table, the first question may be answered with 2 per cent

 To answer this question I have collected the figures given in the literature which rep-

TABLE III

4giko,	Sarcoms	Post- oper	Recur rende	Total	Fet cent	Over one year free from te- currence	Remarks	
v Franque, München. med. Wchnschr , vol. 98 No 41 Vert, Handb n	26 42	?	3	3	12	7	3 of the 7 doubtful sar- coma	
Weil, Handb, p 55 Stroganowa, Monatschr, vol 18, p 366	57	o S	20	? ? 25	38	147	Vag Hysierectomy Supravag Amp	
Pignaud, Rev. de Gyn., 1905, p. 850	36 53	0	13.	13 25	48 38 48	24 27	Mucosa sarcoma Interstitual sarcoma	
Gessner (Winter), Ztachr f Geburtsh, v Gynäk, vol 57, p 19 Klein, Monatschr, vol 7, p 116 Menneke	36	3	3 13	16	75 44 7	7 6		
Torkel, Monatschr, vol. 29, p. 346 Rogione, Diss. Zürich, 76	50	6	33	35	76 0	3 2	Excision Supravag Amp	
Feider, Dias Bern, 1907	5 3 3	0	3 1 3 2	3 3	50 66 66	;	Vag Tot Exst Tot Ex Exploratory Lap	
Total Felder Our cases	13	3 1	7	Ŷ	60 20	6 2	_	

I a of the sa a years later dead from recurrence

2 Ducharged uncured

resent radical operations such as are usually done in myoma cases as shown in Table II

These figures must, of course, be more closely, scrutinized. Olthausen, for example, operated on about 15 per cent of his myorin cases, whereas Noble wanted to operate on every case. It is self-evident that the stricter the indication for operation the greater will be the mortality, other things heing equal. Good statistics may also be obtained by returning to operate on serious cases.

Considering the figures here given, the primary mortality of the radical myoma operation seems still to be between 4 and 5 per cent

3. What are the primary and permanent results of this same radical operation when done on cases of sarcoma of the uterus? Table III

Among the 180 cases which I chose from the literature to answer the fourth question, and which can be seen in full in the current number of Strallerapie, 23, or 127 per cent, were reported free from recurrence of surcoma after a period of 12 months or more. Of these Soc cases, 5x deed, some following the operation and some from recurrence or metastass; 76 cases were not followed over 12 or metastass; 76 cases were not followed over 12 or metastass; 76 cases were not followed over 12 or metastass; 76 cases were not followed.

¹ Essen Möller operated on §1 5 per cent of 200 cases, Wanter, on 45 8 per cent of 702 cases, Olshausen, on 10 g per cent of 927 cases and Hofment, on 0.0 per cent of 378 cases.

menths If these 76 cases be excluded, the total mortably from operation and failure to cure would reach the high figure 70 per cent. Of the 180 cases, 74 were sarcomata of the uterine wall, with a mortably of 47 5 per cent, 40 were sarcomata of the mucosa, with a mortality of 42 5 per cent, and 66 cases, in which the kind of sarcoma was not designated, had a mortality of 40 op per cent.

From a consideration of these facts it seems clear that even with the use of the operative treatment a certain cure of more than 25 per cent at the most cannot be assured.

4 Little if any progress has been made in the diagnosis of sarcoma of the uterus. All authors agree that a diagnosis is almost impossible in the early stages, when the usual signs of malignancy fail. A microscopical examination should be made upon the least suspicton For the X-ray therapeutist, however, the question of diagnosis can be put concretely as follows: What per cent of the sarcoma cases described in the literature would we get through failure of diagnosis subject to the X-rays instead of the operative treatment, had they all come to us in consultation?

To answer this question I have read over nearly all the reported cases of sarcoma of the

⁹⁴ of the 95 4 years later dead from recurrence

aterus, and have selected those cases which satisfied the following conditions2:

- 1. A radical operation, i. c. extirpation of the uterus
- 2. A microscopic corroboration of the diagnosis, or a history of subsequent recurreuce or metastasis.

Cases under 25 years of age and obvious cases of cervix sarcoma, chorio-epethelioma, and carcinosarcoma have been left out of consideration, because they do not bear on the

I presented the cases thus selected to Prof. Kronig, who answered the question whether or not he would subject each case to the X-ray treatment, using the indications which obtain in the Freiburg clinic as given in the monograph of Gauss and Lembeke Among the 180 cases selected there were q in which an answer was impossible because of poor histories and findings; in some cases the diagnosis had been made previous to operation, and it must be assumed that it would also be possible to make the diagnosis to-day

180 cases is as follows.

f Of 180 cases, 55, or 30 5 per cent, would receive X rays, 116, or 64 4 per cent, would not receive X-rays, 9, or 5 per cent, unknown

- received X-ray treatment, 7, or 12 7 per cent, under the operative treatment, were reported more than 12 months later as free from recurrence; 24, or 43 6 per cent, died following operation or from recurrence; 24, or 43 6 per cent, were not followed over one year
- (b) Of the 116 cases which would not have received X-ray treatment, 14, or 12 per cent, were reported over 12 months later as cured, 52, or 44 8 per cent, died following operation or recurrence; 50, or 43.2 per cent, unknown.
- ble, 2 were alive over one year, 5 died following operation or recurrence, and 2 were not reported.
- sarcoma separately, the following figures are obtained: There were 74 out of 180 reported

problem in hand

The results of the consideration of these

(a) Of these 55 cases which would have

(c) Of the 9 cases where answer was impossi-

2. If we consider the different kinds of

These cases may be seen in Table IV of my article in Strahlen therapie, Ed ii, Il z 2013

as interstitial in origin, of which 32 would have received X-rays, 39 would not, and 3 were doubtful.

(a) Of the 32 which would have received X-ray treatment, 3 were free from recurrence after 12 months, 16 died, and 13 were not reported.

(b) Of the 30 which would not have received X-ray treatment, 2 were free from recurrence after 12 months, 18 died, and 10 were not reported.

(c) Of the 3 doubtful cases, 1 lived over a Year, 1 died, and 1 was not reported,

4. Only 3 out of 40 sarcomata of the uterine muco-a would have received X-ray treatment; 36 would not, and 1 case was doubtful.

(a) Of the 3 cases which would have received X-ray treatment, I lived over a year,

I died, and I was not reported. (b) Of the 36 cases which would not have received X-ray treatment, a lived over a year,

16 died, and 14 were not reported.

4 Of the 66 cases in which the origin of the sarcoma was not designated, 21 would have been rayed, 40 would not, and 5 were doubt-

(a) Of the 21 cases which would have rectived X ray treatment, 4 were free from recurrence over one year, 7 died, and 10 were not reported

(b) Of the 40 cases which would not have received X-ray treatment, 5 were reported well alter one year, 16 died, and 10 were not reported.

(c) Of the 5 doubtful cases, 1 was alive after

one year, and 4 died.

If we consider the above given figures it must be admitted that, of the cs cases which we should have treated with X-rays, 7 would perhaps have died under that treatment, whereas they were really reported after one year as cured We can, however, be satisfied to have so few as 7 when we think of the high mortality and poor end results of the operative treatment.

Out of 74 interstitial sarcomata, 32 would have received X-ray treatment, i. e., if one may be allowed to say so, a mistake in diagnosis in 43.2 per cent of the cases. We do not go so far as to say that all the other cases could have been diagnosed, but many cases are excluded from the X-ray therapy on the ground of the contraindications to it and because of other conditions which in themselves would lead to operation.

The best diagnostic results are in the mucosa sarcoma group, where we should have made mistaken diagnosis in only 7 5 per cent

of the cases

We may reckon in general 2 sarcomata among 100 myoma cases, let us now consider a mistake in diagnosis of 43.2 per cent, and we should have, among about 125 myoma cases, a which through failure in diagnosis would be subjected to X-ray treatment. In this sense, then, one can reckon the mortality of the X-ray treatment as 0.8 per cent, which compares very favorably with the high primary operative mortality of myomectomy This corresponds exactly to the experience in the Freiburg clinic, for of the 5 sarcoma cases we should have treated only 3 with X-rays, and one died anyhow following operation, which makes 2 out of 318 myoma cases, or 0 63 per cent, as our theoretical X-ray mortality.

In the following pages I shall review briefly this experience Since October 10, 1906, all myomata removed by operation in the Freiburg Frauenklinik have been carefully examined in the pathological institute under the control of Prof Aschoff Up to February 7, 1011, among 240 myoma cases not a single sarcoma was found Between February 7, 1011, and July 28, 1012, there appeared suddenly 5 sarcomata among 69 cases It would be wrong to draw any conclusions from either series of cases As Schottlander says, "The principal reason for the high figure (5 7 per cent - Basso) may perhaps be the relatively small number of cases and the appearance of relatively many malignant changes within a short period of time 4

In the space of time between January 1, 1909, and February 7, 1911, 47 myona cases were treated entirely by X-rays, between February 7, 1911, and July 28, 1912, 138 myonac cases were rayed No one of these has up to the present time shown signs of malignancy.

Zentralbl f Gyntk , rors, p 657

Among the 318 operated myomata were care sarcomata, i. e. 1.6 per cent. If we reck on the X-ray cases with these, we should get got myomata with 5 sarcomata, or 1 per cent. Furthermore, had we as a matter of principle treated every case with X-rays, we should still have rayed only 3 out of the 5 sarcomata. Case 2 was pregnant, and Case 5 was previously diagnosed. Again, Case 1 died after operation; she could not have done worse land she been treated with X-rays, the probabilities being in favor of prolongation of life for several months.

The individual histories are given below.

Case: A 50-year-old peasant woman, who had suffered for 10 years with heart trouble following influenza. The first menstruation appeared at the age of 14 years, the last menstruation was 4 days previous. Patient has had no children. The menstruation was 500 men that the patient complains of shortness of breath, cough, expectoration, and constipation. For the last 3 months, pans in the right side when lying on the felt side. For one month, ischuria.

lying on the left side. For one month, ischuris.

Enomusion. Mbp 24 to sport cent; wine shows
traces of albumin. I kneat is poorly neutrable abort of breath. The uterus cannot be well felt; the
cervar is drawn high up, the vagina funnel-shaped,
and the uterus could not be sounded. A hard timor
fills the pelvis and reaches the umbilicus. Diagnosis,
Myomaia uteit, inchuna paradora, myodegeneratue
cordis Operation June 26, 1911, morrellement and
supravaginal amputation of the uterus. Evitus after
20 hours. Pathological report Spindle-cell sarcoma,
interstitual type. Lung metastanes.

CASE 2 À 36-year-old factory worker, who has always been well Menstruation was without unusual features The last period was 5 to 6 months ago During the last 4 months the patient has complained of abdominal pain The abdomen has

rapidly grown

Exomination Uterus anticlected, drawn to the left, and about the sace of airt. It is pressed to the left by a tumor twice as large, which feels hard. The vaginus is related as in pregnancy, but is not bluish in color. The cervix is open. Uterus on sounding measures 14 cm. The breast contain colostrum. Diagnosis: Pregnancy in the fifth to sixth monthly myonan (tumor of the ovary!), Opension. May myonan (tumor of tumor of tumor of tumor of tumor of tumor of tu

Case 3 A 40-year-old woman, a conductor's wife, who has had 5 children. Periods at first weak, have become stronger during the past year. Patient

complains of headache, backache, abdominal pains, dizziness, and shortness of breath.

Examination Pale, moderately well-nourished woman. Systom armury at the spex, increase of the second pulmonry sound. Uterus hard, enlarged, movable on the side of the uterus is a tumor. Operation. Speciation for port, total extinction of the sixth day, when a slight thrombosis developed. Since the report came that the was smallganat, an inguinal gland which has smollen was removed on the 17th day. It was report to the report on the 17th day. It was report to the report of t

CASE 4 A 47-year-old woman, a day laborer's wife, who has had a children and one abortion. The last birth was 20 years previous. Menses have been regular, weak, and somewhat pairful Paient seeks medical advice heeause of pains in the abdomen and hear which work hear was a second to the pair of the abdomen and hear which were hear the second hear th

back, which occur before and after menstration. Examination Fale, well-nourished woman; weak presystolic murmur at the apex. Vagina narrow, errux closed, uters the size of a fast, retroverted, hard, and fixed The adners are not to be felt plaquously flyama uteri. Operation. Fobrancy, 7811, Ext. tot., cum adnersa smistris. Highest actured on the adnersa smistris. Highest actured on the App. On the state day. Discharged as cured on the App. on the state of t

CASE 5. A 56-year-old peasant, who was never sick; II-para. Two years ago, when the patient was operated on in this clinic, the following notes were made:

Patient complains of a fullness and pressure in the ahdomen, with shooting pains and increase in size Diagnosis. Cystoma ovarii (carcinomatosis pentonei?). Operation. November 4, 1910, cystomectomia dextra, Salpingoophorectomia sinistra, appendectomia Difficult on account of adhesions. Fol lowing the operation, menstruation ceased During the last 15 months there has been a vaginal discharge, which grew more copious and ill smelling Patient has lost weight Examination. Slinking vaginal discharge. The corvix admits one finger and contains disintegrating, easily bleeding tumor masses. To the right of the uterus, a small tumor the size of a plum Parametria not involved. Diagnosis. Submucous myoma or corpus carcinoma. Pieces of the tumor removed gave the following microscopical findings. The pieces of tissue are largely hamorrhagic and necrotic, and in single instances around the blood-vessels is a zone of large, plump spindle cells. It is a case of spindle-cell sarcoma, perhaps myosarcoma. Operation December 20, rorr, Wertheim extirpation, with preliminary camphor oil treatment. The wound later became necrotic and healed slowly. Discharge on the 201h

day. Control. June 5, 1912, no recurrence. Pathalogical report. The diagnosis of sarcoma is confirmed.

Let us now consider the cases reported by Warnekros.1 Is be justified in saying that his seven sarcoma cases would have surely died if X-rays were the routine treatment? Prof. Aschoff was kind enough to help me answer this question by criticising the microscopical illustrations accompanying the article of Warnekros. His answer, based on the illustrations, was that only Cases 2 and 7 can be considered as undoubted sarcoma; Cases 1, 4, and 6 are doubtful, and in Cases 3 and 5 he could not agree with the diagnosis of sarcoma. In Case 7 it is to be regretted only an enucleation was done. Case 6 was 54 years old, and we should have used X-ray treatment cautiously; and if it had not reacted within a very short time, we should also have operated.

Even if all these cases had been treated by X-rays, it does not follow that they would all certainly die hecause of false treatment; we know, indeed, that X-rays have a destructive action on carcinomatous and sarromatous growths in other parts of the hody, so that such an action might even he expected in these cases under the intensive X-ray treat ment as it is called in the intensive X-ray treatment as it is earlied out to-day. This checking action of the X-rays may indeed give us the right to use the X-ray treatment conditionally in uncertain cases, and later undertake operation, without making any great difference in the chances of cure.

The four cases of Bumm, which Warnelstos also reports in his paper, agree with the answer I made to question No. 3. Four out of soo myoma cases died later of sarcoma recurrence, in spile of the radical operation. We should furthermore have treated only 2 of the 4 cases with X-rays. Case 2 was 63 of the 4 cases with X-rays. Case 2 was 63 or the 4 cases with X-rays. Case 2 was 63 or the 4 cases of the 4 cases of the 4 cases with X-rays. Case 2 was 63 or the 4 cases with X-rays. Case 2 was 63 or the 4 cases with X-rays. Case 2 was 64 or the 4 cases of the 4 cases of the 1 cases of the 1

The fears of Warnekros seem, therefore, to be well grounded, and indeed it appears all the more so since even those who formerly were its hitterest opponents have lately

Arch f Gynth, sprs, H. 3

become enthusiastic users of the X-rays in treatment of myoma of the uterus.

The fear of the knife does not exist, as Flatau says,1 "in indirect proportion to the trustworthiness of the physician in question " For the public, the timidity in facing operation plays a great rôle, and one will always have to reckon with it. Sarwey, indeed gives us definite figures concerning it reports that of 460 patients who should have been operated on, no less than 30 could not take the treatment, and 10 indeed absolutely refused. He found out later that no less than 6 of these died, probably because of lack of treatment He does not reckon these eases however, in his mortality list It is therefore self-evident that the figures given as primary mortality of the myoma operation do not tell the whole story

RÉSUMÉ

To sum up briefly, I may draw the following conclusions

I Sarcoma may be said to occur in about

2 per cent of all myomatous uters

1 Attehr | Gebuttsh u Gyank 1912 Bd let H 1

Zivelir i Geografia i Gyang tota ad Et H 3

- 2 The primary mortality of the operative myoma therapy is still about 4 to 5 per cent
- 3 A lasting cure of sarcoma of the uterus by the operative treatment can only be expected in 25 per cent of the cases at most
- 4 Considering the advantages of the X-ray over the operative treatment in regard to assured freedom from fatality, mistakes in the diagnosis of sarcoma amounting to 0.8 per cent make little difference
- 5 When the public learns that not every tumor of the uterus demands operation, but that there are also efficient conservative methods, we shall certainly be in a position to get hold of more malignant growths in the curable stage

In view of the above facts I believe there can be no further doubt that a routine operative treatment of myoma of the uterus, for fear of sarcomatous degeneration, need not be cartied out This ghost should be buried at once

It is my pleasure to thank Prof Kronig for the suggestion of the theme and for the free use of his material and Dr Schlimpert for his kind assistance in the preparation of the paper

DEPARTMENT OF TECHNIQUE

A REPORT ON TWO CASES OF CERVICAL RIB AND AN OPERATIVE MEASURE TO PREVENT RECURRENCE OF SYMPTOMS

By C. Ht.Gli McKLNNA, M. D. Chicaco.

A REVIEW of the literature on neuritis of the upper extremities convences one of the fact that until recently many cases of supernumerary or cervical rib passed unrecognized

Embryologically, the anterior portion of the transverse process of the cervical vertebra is the "analize" of a rib. Why this structure in the seventh cervical vertebra should continue to develop in certain cases and not in others cannot be definitely determined.

For a number of centuries anatomists have recognized extra cervical ribs, but this anomalous condition was not associated with the clinical phase which we now know these ribs produce

The X-ray, properly interpreted, has donmuch to bring out the underlying cause of ocalled brachial neurits. Not infrequently surgeons meet cases where inceptenence in the use of the X-ray has led play actain to make an incertered diagnosis of boine lessons. The mention this from the fact that, in the first case reported in this paper, two medical men failed to recognize a cervical rib with the use of the X-ray, even aller the case had been reported to them as one of supernumerary rib.

I believe the complete and permanent success of the operation for the removal of a cervael rist depends principally upon two points in technique (r) An inceison that give easy access to the risb, so that it may be removed entirely with a maintain amount of trauma to the brachal pleus and subclaisan vessels, (r). The proper protection of the pleus and vessels from the upper surface of the first dorsal ris, which has been demuded of its periodic pleus and the removal of the ossession statement of the distal end of the offending cervical risk.

In the author's plan of operation, an incision is made from a point midway between the origin and insertion of the sterno-cleido-mastoid muscle and along its posterior border in a straight line to the lower border of the clavicle. A second incision is made parallel to the first, and two inches postemuscle, to a corresponding point on the clavicle.

These two incisions are now connected by a third incision, carried over the clavicle as shown in Fig. 1.

Figure 2 shows the author's method of employing a portion of the scalenius medius muscle to cover the upper surface of the denuded first rib, thereby forming a cushion for the brachial plexus and subclavian vessels.

I igure 3 illustrates the position of the nerveand vessels lying on their new bed of muscle tr-sue taken from the scalenius medius muscle.

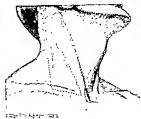
Closure of the wound in the onlinary way The arm is wrapped in an abundance of cotton and placed on a posterior splint

IDSTORY OF CASES

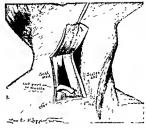
Case a referred by Dr. S. J. McNell. Mrs. J. ace 33. howeverfe, June 23 1911. Jennily, Juntory. Father dead of kotonion or actual mothers death quiden, cause unknown, one tendber law, and in good beath, one steel lives great at good health one death, by accedent. Primord fainter at good health one death, by accedent Primord harder, and the state of the

I xamination of the right hand and arm showed marked mecoular arendy and weakness, disturbed sensation throughout the arm. There were obers not the think and expected alterative wine it represents the communication with a path-depocal compound fracture of the second philangest home of that finger, brothist about by a disturbed circulation and intervalsion. Examination of the temporary of the second philangest home in the right side of the nock, about the classific, between the posterior border of the sterior marked much can be the classific, between the posterior border of the trapeasis much. No any perturbance which this time to be a bony correctors are all the contractions of the contraction of the contra

Case z, referred by Dr A It Bauer Mrs M M age za Family history negative Personal history







Housewife, two thildren, no miscarriages, never sick before Menses normal and regular, utination normal, bowels regular Present condition Gradual onset, with increasing weakness and coldness of right arm and hand, began about two years ago Grasp of hand weak, right lorearm thinner than left, patient is right handed Exammation Medium size woman, bones are light, fair development Head negative, chest negative, abdomen negative Right arm shows muscles flabby and atrophied, the arm is thinner than the left, especially below the elbow Muscles of thenar eminence especially wasted Fingers of right hand appear long and thin Grasp of this band weak Arm and hand cold Has difficulty in picking up pins X ray pictures show a well-developed cervical rib on the right side and an undeveloped corresponding rib on the left side, represented by a short costal proection attached to the transverse process of the seventh cervical vertebra

Case 1 is particularly interesting from the point of view of age. In the relatively large number of cases reported in the literature of this subject, the majority of the nationts began to show symptoms long before the twenty-fifth year The late age at which this patient began to complain of her distress may partially be accounted for from the fact that for the past five years she was of the Christian Science persuasion. Her "belief" may explain the endurance of pain during the period, beginning with an ulceration of the right middle finger and ending with a complete compound pathological fracture of the second phalangeal bone of that digit, at which time she presented herself for surgical intervention, and which represented a period of nearly two years.

Referring to the post-operative history of this case, I wish to place special stress upon the length of time paralysis remained in the entire right ram - a few days short of two months This

temporary nerve disturbance obtained despite the fact that the most detailed precautions prevailed in protecting the brachial plexus from the slightest stretching or injury during the operation. After two months, however, the paralysis disappeared and recovery was very rapid, so that at this time - over a year after the operation the patient has a perfectly normal condition in her arm and hand

The broken finger bone above referred to was amputated a month after the original operation, when the circulation had improved following the removal of the offending rib

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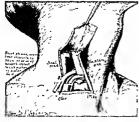


Fig. 3

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LATERAL INTESTINAL ANASTOMOSIS; A MODIFICATION OF THE FERGUSON-GRANT METHOD

BY RAYMOND C TURCH, M D. JACKSONHLE, FLORIDA

A NUMBER of methods for the lateral union of intestine have as a prime consideration the completion of as much of the suturing as possible before making the anastomotic incision, the object being to a vod soling the field of operation with bowel contents, which is the inextable accompanient of all operations in which the bowel is widely opened before the sutures are inserted.

These procedures may be divided into two classes those in which suture alone is employed, and those in which suture alone is employed. In none of these operations has it been possible to absolutely prevent leakage of material from the bowel, and many of the methods offer further disadvantage, in that there is a tendency to over-

manipulation of the gut and to faulty suturing Of such procedures by suture without mechanical aid, the Halsted method of placing and tying the lower row of stitches and inserting the upper row of sutures before making the incisions in the bowel most nearly fulfils the first indication, yet it is necessarily a slow operation because interrupted sutures are employed, there is a possibility of leakage between sutures, and even if the writer's leak-proof interlocking suture is used there is still danger from hæmorrhage from the cut mucosa, there is mevitably much handling of gut, with the possibility of subsequent shock, there is undoubtedly a lesser degree of safety in any intestinal reparative operation in which dependence is placed upon but one layer of sutures - disadvantages which should condemn this procedure and all others of its type

The ments of the numerous permanent, subpermanent, and temporary mechanical aids have been widely discussed and tested, and I beheve a majority of surgeons are of the opinion that anastomotic operations which, when completed leave behind no foreign body other than suture material, are eminently the most satisfactory, certainly the most surgical

The ideal intestinal anastomosis should combine the following essential features

A Accurate approximation of peritoncum entirely around the anastomosis This, the basic principle of Lembert, must be considered the foundation of all gastro-intestinal repair

B The cut edges of the mucosa must be secured, to prevent harmorrhage, and to this

might be added, to prevent absorption of infectious material through unsutured raw areas

C The method of suturing should be simple and easily understood and should provide for rapid insertion

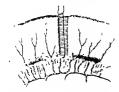
D The completed anastomosis should be proof against leakage, and should be made with two rows of situres — the first to secure mucosand roughly approximate peritoneum, the second row to accurately approximate peritoneum and act as a second line of defense in case of an infection or slough in the area of the first stitch line

C There should be but a minimum of bowel handling as a provision against *ccondary shock. Γ There should be but little, if any, contamination of peritoneum about the operative area.

Lateral anastomosis with the Roosevelt or Moynhan clamp, if made with two rows of continuous sutures, is a very satisfactory procedure, the disast antages being the possibility of injuring the bowel wall by pressure of the clamp beyond the anastomosis and the usual danger of peritoneal infection from escape of small amounts of bacteria laden secretion. The Murphy button, the Dawborn potato plate, and other due res of their type are open to the principal objection, that is, possible pentioneal contamination.

Ferguson of Chicago presented before the Chicago Gynecological Society of 1900 a modification of Grant's enterotome clamp for the facilitation of lateral anastomosis and gastro-enteros-The instrument consisted of a forceps with grooved blades and a spadelike enterotome made to slip in the groove when the blades were closed With this instrument it was possible to complete all the suturing before any opening in the bowel was made other than the small punctures through which the blades entered. In practice, however, it was found that while the use of the forceps aided materially in the placing of the sutures and provided a minimum of bowel handling, it was very difficult to cut through the septum with the sliding knife, and for this reason the instrument obtained no general use. At about this time the uriter devised an emergency lateral anastomosis, using a phimosis forceps in place of the Ferguson-Grant enterotome, cutting the septum with a round-pointed curved bistoury after the completion of the suturing

ligated



lig : Showing bowel crushed by forceps and ligature placed ready to tie



lig 3 Redraun from Kelly Noble, Vol II A, pursestring suture to bury ligated stump, B, tassue forceps invaginating stump, C, cut edge of mescutery with vessels



Fig 4 Purse-string suture tied and stump bursed Cut edge of mesentery secured by whip stitch



I ig 2 Showing ligature field at b, Murphy clamp at a to prevent escape of bowel contents, dotted line at a where bowel is to be divided by cautery

The forceps here pre-ented is simply an ordinary phimosis forceps lengthened, curved on the edge and made hearier so as to act as a crushing instrument. Gastro-enterostomy has been done with this instrument, but it seems to work, out particularly well in all anastomoses of small intestine or in union of small and large

bowed

When bowed ends are completely severed, the method of closure of the ends as north, of some consideration. The board about first the clamped by lacery amportion forcer of the clamped by lacery amportion for the clamped by lacery amportion for the clamped by the some blues instrument is set as a morquite forcer, blues legislater clamped by part of the clamped by the clampe

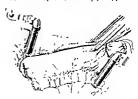


Fig 5 Bowel approximated so that peristalsis is not reversed. Traction sutrice to facilitate insertion of forcess blades through small punctures. Murphy clamps to lutther prevent escape of bowel contents.

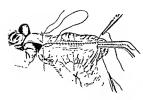


Fig. 6 Forceps inserted, closed and first row of continuous suture passing through all coats begun

shown in Fig. 2. The best practice then is to divide the bowed with the actual cautery at the fine shown at C in Fig. 2.

The mesentery having been divided and any spurting

cessels ligated with fine category, a Lembert purse string suture is placed as shown in Fig. 3 and the stump inverted and buned by tying the purse-string as shown in Fig. 4. The cut edge of the mesentery should then be sewed over with a continuous whipstitch, as shown in Fig. 4.

Both bowel ends having lenn thus treated, the bowsh er laid side by side, slangs mating certain that per stails as not received. A single station side, and per stails as not received. A single station side, small particure are made in each loop of bowel, and the real state of the state of t

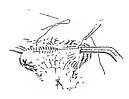


Fig. 7. Lirst row completed around both sides, second row continuous right angled Cushing's suture begun

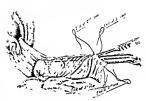


Fig. 8. Tirst and second row of sutures completed with ends left long, curved bistoury dividing septum through the fenestrated forceps blade.



Fig 9 Forceps withdrawn and opening being closed first suture line with the author's modification of the Connell suture



Fig to First row completed Second row continued and tied to the first end, which has been left long



Completed anastomosis

the small punctures, as a further assurance against pertoneal contamination the forceps at point of entrance may be wrapped with a sponge moistened with a normal salt solution

Beguining near the point of entrance of forceps, the first row of sutures is placed as shown in Fig. 6. suture should penetrate all coats of the bonel, and this can be determined by passing the needle each time until it is felt to be in contact with the blade of the forceps. The suturng is continued around the end of the forceps and back on the other side until it arms at the point of puncture This first row suture should be of hien or of chromic citett. The ends should be left long, that they may be utilized in closing the opening which remains after

the forceps are withdrawn The second row of sutures is then placed, beginning as before at the point of entrance of forceps and continuing around the end and up the other side to the point of punc ture This suture should be of sitk and should be a continu-ous Lembert, or preferably a continuous right angled Cushing Lembert stitch as shown in Fig 7 A back or lock stitch at every fifth or sixth suture will prevent

nuckering and give additional strength

Both rows of sutures having been completed on both sides of the forceps blades, a round pointed curved bistoury is then entered into the fenestrated forceps and the septum cut through, as shown in Fig. 8

The septum having been cut through, the forceps is removed, and there remains to be closed but the small opening through which the forceps entered The first row of statching is best continued by the Connell suture, which penetrates all coats of the gut and inverts the cut edges, as shown in Fig 9 It will be noted that the Connell suture may be out in exactly as the right angled Cushing suture is placed, except that in the Connell the needle penetrates all coats of the howel, taking a bite from peritogeum to mucosa, thence from mucosa to peritoneum, while the Cushing pierces only the peritoneal, muscular, and fibrous coats The continuous Connell suture placed in this manner is very much easier of insertion than if the reedle is completely drawn through each time it enters or emerges from the bowel, as described in Connell's original work The principle and the final result are exactly the same

It will be noted that in this operation there is but a minimum opportunity for peritoneal contamination through escape of bowel contents. more than 90 per cent of the suturing being completed before opening the bowel, the anastomosis is made with two rows of sutures, the first pene trating all coats of the bowel so as to prevent hamorrhage from the mucosa and secure rough approximation of peritoneum, the second row as an additional insurance against lealage and to insure accurate approximation of peritoneum, the anastomotic opening is made any length, from one to five inches, and is generous in width owing to the fact that there will be a slough of that portion of the bowel wall included between the forceps, there is but a minimum of handling of gut, because the bonel is held wherever desired and manipulated by the forcers instead of by traction sutures or the assistant's fingers.

A decided advantage in this type of forceps is that it does not matter how firmly the forceps is clamped, since a slough is desirable to increase the anastomore opening, while in using the Roosevelt or Moynihan clamp, much care must be exercised that there may be no injury to the bonel outside of the operative area

The writer desires to acknowledge the valuable assistance of Dr J Knot Simpson in the perfecting of the technique and in the preparation of the rough sketches which were so accurately redrawn by Mr Chas F Bauer of Philadelphia,



Fig. 12 The author's fenestrated lateral anastomosis forceps

A NEW OBSTETRICAL RUBBER DILATING BAG

By FREDERICK LEO GOOD, M. D., Bostov

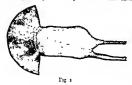
TO longer can there be any doubt as to the efficacy of the rubber bag in dilating the parturient cervix. Neither can there be any question as to its indispensability if we are to do good obstetrics. After using the obstetrical bag for the past five years, I am firmly convinced that it occupies a position second in importance only to the forceps. A rubber bag filled with water everts an equal pressure in every direction; consequently it is the nearest possible approach to the amniotic bag of waters.

I feel that the ideal bag is one that will exert an equal pressure everywhere (a pressure on both the entire cervix and the lower uterine segment). that will not displace the head, and that is easy of introduction Some bags in use to-day exert pressure on the cervix, but not on the lower uterine segment. Other wedge-shaped bags exert pressure on the lower uterine segment and on that part of the cervix in contact with the bag, but if the eervix is not "taken up" there are parts of it where there is no pressure, or at the best an uneven pressure.

I believe that this bag, photographs of which are here shown, overcomes the objections that I have mentioned, and withal it is easy of introductlon

Fig 1 shows the bag before it is filled with water. It is mushroom-shaped and has two separate compartments Compartment A is for eervical pressure and compartment B for pressure on the lower uterine segment Tube C is for filling compartment A, and tube D, which runs directly through compartment A, is for filling compartment B. The compartments are so joined that they give the appearance of but one bag. When ready to be introduced, the bag is easily folded on itself and either an hysterectomy or gastro-enterostomy clamp closed upon it. If the case happens to be one not yet in labor or one with not enough dilatation, the cervix is dilated with a simple steef dilator sufficiently to allow the passage of the bag and clamp. I have found that if there is enough dilatation to easily admit the finger the bag can be introduced without any difficulty. After the bag is introduced, compartment B is filled with sterile water and traction made on tubes C and D. (Filling compartment B and then using traction accomplishes two things: (a) it prevents the bag from slipping out, and (b) it assures us that when compartment A is filled it (A) will be in close proximity to the cervix at every point.) Compartment A is now filled with water. There is then an equal pressure everywhere on the cervix from compartment A, and pressure from the wedge-shaped compartment B on the lower uterine segment. Compartment B will not do its greatest good until the cervix is well "taken up," and ean either be left filled with water or emptied, to be filled again without removing the bag after compartment A has caused the cervix to be sufficiently obliterated. My object in first filling compartment B is to make certain of having compartment A properly placed against the eervix. After compartment A has caused all the dilatation that it is canable of doing, it should not be emptied, as one of its functions is to strengthen the base of compart-

Fig 2 shows the bag with both compartments filled with water The wedge-shaped border of compartment B is plainly visible in the photograph ("E") When compartment B is filled its top ("F") is concave, and at no place measures more than three quarters of an inch from its base to its upper surface. In other words, compartment B is nowhere more than three quarters of an inch within the uterine cavity (yet always





everting great pressure), and cannot displace the head enough to make it of any consequence,

Compartment A is three inches long and 1½ inches in diameter. Compartment B is 3½ inches in diameter, and ½ inch from its hase to its top. Its base being 1½ inches in diameter, its top 3½ inches in diameter, its top 3½ inches in diameter, and its thickness but ¼ inch, its wedge-shaped properties can be easily appreciated. Tube C and D are 15 inches long, allowing them to be folded on themselves and allowing them to be folded on themselves and

tied to prevent the escape of water.

The bug having been inserted, occasional traction is made in order to force the uterne contractions. I feel that cervical dilatation of 3½ inches (the diameter of top of compartment B₃) is sufficient, for when such dilatation is obtained the patient is in hard labor, and contractions would follow in quick succession after the one having accomplished its purpose, was either precinitative versiled or utilization receivable.

traction. The conduct of the rest of the delner; depends on circumstances, and can be either normal or by forceps.

Another advantage of the above described dilator is that a single bag can suffice for all work, and it is not necessary to use a series of bags, starting with a small size and ending with a large one, though the bag can be made of different sure.

if desired.

I shall not discuss the type of cases in which bags can and should be used. Strict aservis is of the utmost importance. The syringe for filing the hag may be of either glass, metal, or robber and should be thoroughly sterilized before using The bug should be filled with sterile water it is well to find out before introducing the bag how much water is needed to thoroughly sinch continuent. Then, after introduction, fill a syringe with that amount of water and inject it into the hag.

RUPTURE OF THE UTERUS1

BY BARTON COOKE HIRST, M D, PERLADELPRIA

I T would be interesting to treat this subject in its entirety were it not so complex, and had we time and patience for its full discussion

From Bandl's discovery, in 1875, of the mechanism of the most frequent Lind of uterine rupture in his time, we might trace with profit the steady development of our knowledge of the subject. Freund's explanation of conditions that determined rupture of the vaginal vault instead of runture of the uterus, the fuller comprehension of the part played by the stretching of the round ligaments in the elevation of the upper uterine segment and the attenuation of the walls of the lower uterine segment, the recognition of a rigid cervix and degeneration of the uterine muscle as etiological factors, the interesting light thrown upon a rare variety of the accident in the collection of twenty-seven cases of repeated spontaneous ruptures of the uterus by Becker, with the addition of an original observation, the series comprising a period of one hundred and forty-two years2, and the information obtained by the clinical studies of spontaneous rupture of the uterus in pregnancy at the fundus - studies, it must be confessed, not enlightening us much as to the etiology of this peculiar occurrence,

the etiology of this peculiar occurrence, every case an From Lambron's case, 1779, to Becker's 1912 The first str

although teaching us valuable lessons in diagnosis and treatment

But I must forego too wide an excursion into the history and detailed description of an obsettic complication that has the greatest interest to us specialists, and must be I trust, of some interest to the general physician, who may at any moment ecocounter this appallung accident in his practice. The scope of this communication is confined mainly to three points in connection with rupbured uterus.

First, that the accident is more frequent now than formerly, although with the progress of medicine it ought to be less frequent, for it is often preventable, it is an evidence, usually, of cross in diagnosis of faults of technique, and is rightly regarded as a reproach to the physician in whose hand, it occurs

Second, the diagnosis is not as easy as the general physician might suppose, in view of the distinctive symptoms and the gross nature of some of them. This is particularly true of soontaneous rupture of the fundus.

Third, the treatment is not to be dismissed by the rule of thumb—to open the abdomen in every case and to amputate the uterus.

The first statement is one, I think, to which the

attention of the profession should be particularly called Ruptured uterus, as previous generations saw it, is not so frequent now; that is, the neglected or unrecognized cases of obstructed labor, with laceration of the lower uterine segment by distention of its cavity and ascension of the upper uterine segment by elongation of the round ligaments. What augments the number of cases now, if I may judge from what I see in consulting practice, is the hasty application of inappropriate means to extract the uterine contents or a clumsy effort to employ the right methods. For instance, in the writer's recent hospital and consulting practice, in a period of nine months there were six cases of ruptured uterus, every one of them from instrumental or manual interference.

In one case, an effort to evacuate the womb with a curette forcep at the third month, for what was thought to be eclampas but was probably hysteria, resulted in a perforation of the uterine wall, the extraction, and the detachment of the whole (wenty feet of the woman's small

intestines In another case, the writer found a young physician with his arm up to the elbow in a woman's abdomen, the patient lay unconscious on a kitchen table. As an explanation the physician stated that the woman was five months pregnant, she had had a hæmorrhage, which was interpreted to mean placenta przevia, he had attempted digital chlatation of the cervix, and version, but found his hand had perforated the vaginal vault and was in the peritoneal cavity, withdraw ing it, he again attempted a dilatation of the cervix and was successful, but this time his hand passed through the uterine fundus and he again found it in the peritoneal cavity. Then, possessed with the not unreasonable idea that his patient must be bleeding dangerously from these two extensive ruptures, he pulled a pocket case from his pocket, opened the abdomen from ensiform to pubis, and through the incision grasped the bleeding uterus It was necewary to tie the uterine and ovarian arteries and to pack the abdominal and vaginal wounds till the patient could be transported to the hospital patient could be transported to the hospital. There a hysterectomy and closure of the abdominal wound with drainage was completed Strangely enough, the patient died of pneumonia on the thart day, and not of peritonitis. She had been taken to the hospital during a severe thunderstorm. As the uterine vessels of the broad beaments were tied, there was a blinding flash of lightning and a deafening clap of thunder driver of a coupe in front of the house was knocked off his seat In a conversation with the patient's bushand a few months later, he said "Just to think, if my poor wife had not been struck by lightning as you furshed your opera-tion, she might have been alive to-day" This was the explanation given by the attending physician

These cases illustrate deplorable tendencies of the day; a superficial medical education; a subserviency to medical shibbofeths such as "empty the womb for eclamptia," "dilate the cervix and do version for placenta pravia," and a hysticical obsession that something active and heroic must be done for all the different emergencies of practice.

The second proposition that the diagnosis is not always easy may be illustrated by these cases:

A woman was brought to the University Maternity by two physicians of many years's experience. One of them said that he auspected that the uterus was ruptured, hecuse in his last examination he believed he left the liver. The uterus was not only almost completely from a comparison of the properties of the control of the woman's area had been pulled off, and two feet of the woman's area had been pulled off, and two feet of the almange out of the vulva.

In another case, a physician said to the writer that he had been in attendance on a partiment patient for two days, the head had been easily left until twenty-four hours woman had complianted of no pan and her physician had noticed nothing airming in her condition, but it was found not not not a surface of the condition, but it was found in the consultation that the uters had ruptured, the child had been empelled into the abdominal cavity, and the physician had consultant left the room me.

A that case was in the writer's service in the Philadelphia Hospital Nothing unusual was noticed about the patient's labor or puerperium, but when she got out to the the were sudden guahes of water out of the vagins. It was found by the uterine sound and a chemical examination of the fluid that the postrior uterine wall had been ruptured and that the perforation communicated with an encysted accides.

A fourth case came into the Howard Hospital a month after delivery, with what I thought was an intrapertoneal abscess in the region of the unbilicus. On opening the abdomen a localized abscess was found in this situation, but the cause of it was a rupture in the fundus uters, from tube to tube, that had never been suspected.

Finally, it must be remembered that many a case of ruptured uterus may be saved by gauze packing of the pelvic and of the uterine cavity. To illustrate, the writer, in performing a version and a slow careful extraction of the foctus for placenta prævia, ruptured the lower uterine segment, cervix and vaginal vault, which tore like so much wet paper. There was an onfice into the peritoneal cavity, into which the outspread hand could be passed. The pelvis was packed with gauze and so was the uterus The uterine packing was removed in twenty-four hours, but the pelvic packing was left undisturbed for four days, when it was removed and replaced by fresh The patient made an uncomplicated recovery. It is interesting in this connection to recall the series of ten cases thus treated, recently reported from Germany, without a death

On the contrary, if the rupture is anterior or lateral, if there is much intraperitional harmor-hage, if the placenta or fortus has escaped into the abdominal action is required and most likely a hysterectomy. Moreover, the control of hemornhage and the evacuation of blood clots may be the most difficult part of the operation. In a case in the writer's out-

patient department, labor was obstructed by hydrocephalus. There was a breech presentation. The student in charge failed to recognize
the obstruction. The uterus ruptured. A consultant rapility extracted the after-coming head,
probably increasing the laceration. When the
patient was brought to the hospital, she was as
near dead from harmorrhage as anyone could be
and recover. It was necessary to turn out the
retroperitoneal blood clots as high as the kidney,
hy incising the posterior parietal layer of the
peritoneum, and it was only after a bysterectomy
that the bleeding vessels could be secured.

Finally, if I might be permitted to offer advice to the general physician on this subject of ruptured uterus, it would run somewhat as follows:

Cultivate the ability and the habit of making exact diagnoses of the comparative size of focus and maternal pelvis; estimate the degree of resistance to be overcome and the expulsive power available to overcome it; avoid hasty manual and instrumental interference and methods of extraction that must, from the nature and degree of the obstruction, prove futile; but do not delay the application of the appropriate method too long, bear in mind the symptoms of ruptured uterus and the fact that they may be far from distinctive in certain cases; he prepared to put into immediate effect the treatment apparently most suitable to the individual case, whether it be simply gauze drainage or a difficult, complicated major abdominal operation.

THE AFTER TREATMENT OF SUPRAPUBIC PROSTATECTOMY

BY G KOLISCHER, M D, CHICAGO

THE after treatment of this operation begins the moment the patient returns from the operating table to his bed The special care of the field of operation will be considered

After the patient has been placed in bed, the distal end of the glass coupler is freed and connected with a long rubber tube. Then by means of a hand swringe the tube, the glass coupler and the bladder are filled with horse acid solution, and the end of the long tube is submerged into a few ounces of antiseptic fluid contained in a graduated glass jar which is placed on a level a few feet lower than the body of the patient, by the submerging of the free end of the filled tube a syphonage is established As the frontal branch of the gfass coupler is kept free of the dressings a permanent control over the drainage can be maintained, for instance, in the case of interference with the flow of the fluid by coagula or by air hubbles, the free flow will be restored easily by again injecting boric acid solution through the distal end of the tube into the bladder and then again submerging the free end of the rubber tube into the fluid of the receiving vessel. The graduation of this vescel permits the measuring of the secretion of urine in a given time by subtracting the original amount of fluid from the total amount of fluid collected. In order to prevent softing of the bed and of the thighs and the perineum of the patient,

the penis is either placed in a urinal or a rubber glove is tied over the glans penis. The abdominal dressings are to be removed once in 24 bours, and at that time the application of the silver nitrate paste is to be renewed. Especial care to force some of this paste between the tube resting in the bladder and the tissues surrounding it is to be taken, as the effects of this silver tend to counteract the deleterious effect of the urine that may result from its contact with the denuded tissues. The glass coupler is also detached from the tube draining the bladder, and the viscus is emptied by gentle manual pressure on the abdomen, after which two ounces of a 20 per cent argyrol solution are injected through the bladder tube into the viscus After this the glass coupler is reinserted and the connection with the long tube and the syphonage is re-established in the way above described and a fresh dressing is applied. While the laboratory experiment proves argyrol to be of only moderate bactericidal power, its clinical efficacy cannot be denied. Any prevesical packing or drainage is removed 36 hours after the operation

On the third day the glass coupler is definitely removed and the bladder is flushed out through its drainage tube with a 15000 silv or solution until the fluid returns clear, in order to remove all blood or pus coagula, after the bladder is again empted by gentle pressure on the abdomen a 20 per cent ang, rol solution is injected. By a quick twisting motion the catput suture fixing the tube in the bladder is now broken and the tube is removed. A longer retention of the tube would lead to pressure necrois: After the removal of the tube silver nitrate pasts: smeared into the fistula and the suture line is also now reed with the fistula and the stuture line is also now reed with the The abdominal skin is protected from the macerating effect of the utine by a thick coating of vaseline, which is renewed at each dressing. The whole field is covered with fulfured gauze and on top of that is placed an oak um pad, the dressing will be changed every time mostare has penetrated the padding

As to the appliances devised for catching the unre flowing out of the supraphuc fistula, the In ing-Ferner cup apparatus cannot be employed in the early stages, because shortly aller the operation the patients cannot stand the pressure of the cup on the suture line. It is useful later on in cases in which the fistula persusts for several week. C.M. McKenna's double rubber apron caches the supraphical of the supraphical control of the case of the supraphical operation without causing any discomfort, but as to keeping the patient dry it works satisfactorily only in rather fleshy individuals. With proper care the patients can be kept quite com-

fortable without any special apparatus Usually the patients begin to urinate about the seventh day after the operation, in case of its delay the passing of a few large calibred sounds will start the natural urination It is helpful to instruct the patient to close the fistula by manual pressure during the attempt to pass urine through the penis. The healing of the fistula will be hastened by repeated cauterization with a silver pitrate stick In case the granulations are particularly sluggish, dressings dipped in tinctura myrrhæ are to be applied The application of scarlet red had better be avoided for two reasons in old people the danger of amlin poisoning is always great, and secondly, the rapid epithelialization produced by this drug may also lead, as has been observed, to epithehalization of the canal leading down to the bladder, preventing closing of the abdominal fistula In case of the occurrence of such an event for some reason or another, the sinus is to be thoroughly cauterized with a galvanocaustic burner This procedure is preferable to freshening the walls of the fistula by curetting, as this is often followed by a profuse hæmorrhage Sometimes, in spite of all precautions, infection of the suture line occurs, when exquisite tenderness, dark red coloring, considerable fever, and pronounced increase of leucocytes point to severe infection, the whole suture line has to be laid wide open in order to relieve the

tension and to prevent sloughing of the faccia.
This latter event is exceedingly serious, as it delays healing markedly and is almost invariably followed by a ventral hernia. Moist dressings are applied until the sensitiveness disappears, later on a 1 per cent silver salive with an addition of balsam of peru is applied. In case of pronounced kidney lesions the balsam is better dispensed with The cleaning up and healing of such an infected wound is greatly furthered by the use of prolonged warm tub baths before each dressing.

In the case of a post-operative hamorrhage of importance, it is first necessary to locate its origin to ascertain whether the bleeding takes place inside of the bladder or in the retrosymphysial space. In the latter case the lowest sutures are opened and the prevesical space tightly packed with gauze If the hamorrhage comes from the bladder a double compression has to be used A colpeurynter is introduced into the rectum and is distended to its capacity by filling it with water from a hand syringe, while a heavy sandbag is placed on the abdomen over the bladder region, the knees of the patient are kept in flexion by pillows. To increase the coagulability of the blood to cc of serum are injected hypodermically. Opening of the bladder for post-operative hamorrhage and packing in order to check it, does not as a rule furnish very satisfactory results, firstly, the necessary manipulations often lead to severe infection, and secondly, the hæmorrhages very often recur after the removal of the packing

The appearance of phosphatic concretions in urine after the first week signifies that the dissolving of the catgut on the inside of the bladder does not proceed satisfactorily, thereby producing a precipitation of urinary salts This condition is treated by flushing the bladder daily with a 1 5000 salicylic acid solution In rare cases it occurs that the granulations at the former site of the enucleated tumor persist even after the abdominal fistula has closed. This shows itself by occasional hæmaturia and by the appearance of phosphatic crumbs in the urine A cystoscopic examination will ascertain the facts, in case these granulating areas he close to the internal urethral orifice, they can be scraped off by introducing a slender uterine curette into the bladder and curetting them, while one or two fingers placed in the rectum control the movements of the instrument; this scraping is followed by flushing the bladder with an indifferent fluid and the instillation of a few drops of a 5 per cent silver solution into the again emptied bladder. In case that these granulations are located further back in the bladder, they have to

be curetted and cauterized through an operative cystoscope, either treatment soon succeeds in bringing about epithelialization of the granulat-

ing spots

In the general after treatment the following points have to be observed after the syphnnage is established, the patient is put on the Wernitz drop by drop rectoclysis, as a matter of routine. as fluid a 3 per cent glucose solution is employed This solution is absolutely innocuous to the kidneys and is of a very high nutritive value, with a selective action on the heart irrigation is continued for three hours, when a rectal tube is inserted for an hour, and on removal of this tube the rectoelysis is again started This process in turn continues until the national is able to take enough fluid per mouth to maintain a sufficient elimination. In case the amount and quality of the urine should show that in spite of all this the action of the kidneys is deficient, in addition to the restockyst diuretin is to be given internally or with the irrigation, are grains three times a day On the second day after the operation the patient is made to sit up in bed and is taught breathing everenes twice a day. On the third day the patient is taken out of bed and put into an easy chair. On the fourth day, if there are no strict contraindications the patient begin-

to walk around

If for some reasons the patient is unable to re-

tain food on his stomach after the first 24 hours, a 3 three per cent glucose solution is injected hypodermically twice in 24 hours, 200 cc at one time

It is very important to secure for these old people a sufficient amount of sleep. Hence if the sleep does not come naturally it has to be forced by the administration of veronal or a similar drug. The use of morphin on account of its detrimental influence on the kidneys has to be restricted to absolute necessity. The heart action has also to be carefully watched, and in case of dilation digitalis or one of its derivates is to be administered The seventh day after the operation is often of critical importance for the patient. as at this date in spite of good progress so far the Lidneys will sometimes cease to act properly. As it is impossible at this period to measure the elimination by collecting the urine, the other signs must be particularly watched for. If the skin becomes dry, if the perspiration even after a bath to only seant and of a urinary smell, if the tongue so dry and the patient is drowsy, then the action of the kidneys have to be stimulated by all the means at our command administration of diuretin, rectoelysis, hot packs over both the lumbar regions, and finally venesection if the pulse is of a very high tension. In case the patient should lanse and remain in a urremic stupor, lumbar puncture has to be employed

THE TREATMENT OF TUBERCULOUS JOINTS1

BY JOHN & PORTER M D CHRAGO

I doubt if there is any surgical disease which has been the subject of so much controversy as to methods of treatment, or which has been subjected to such a wide diversity of methods in treatment, as tuberculosis of the joints. But it seems to me that each year brings a little more unanimity of opinion, that we find ourselves discarding more of the multitudinous suggestions of doubtful value and, letter than all, we are treating each case individually and following the distinct indications in each case, instead of treating every case by a method of fixed routine for which we are mable to give a logical reason

There are three facts to be borne in mind regarding joint tuberculosis. First, tuberculosis of the joint in a person of normally good resistance is naturally a self-limited disease, second, it al-

ways results in deformity and disability; third, the amount of deformity and disability depends upon the extent and iluration of the disease. When I say that joint tuberculosis is naturally a self-limited disease, I mean that when the patient's resistance is not weakened by poor nourishment, poor hygiene, or poor heredity, most cases get well, but, left untreated, the joints will show some permanent deformity and disability when recovery takes place. And since the amount of deformity depends upon the extent and duration of the disease, it must depend very largely upon the efficiency of treatment and the promptness with which it is begun Knowing these facts, the indications governing any method of treatment are: First, increase the patient's resistance in every possible way, second, put the

joint into the best position for future usefulness when recovery has taken place, third, prevent the development of deformity so far as is possible I say, "so far as is possible," because in some joints it is not always possible to prevent all deformity. I have never seen a case of middorsal spondylitis recover without some degree of Lyphosis, and rarely does a tubercular hip get well without some shortening and loss of motion But, knowing these things, it behooves to see that the patient is spared as much of the distressing deformity as we can, and that he recovers with as good function in the joint as possible Treatment of tuberculous joints is logically discussed under the following headings First, mechanical, second, surgleal, third, complications, fourth, medical and hygienic

MECHANICAL TREATMENT

Without doubt, the most valuable procedure in the treatment of any tuberculous joint is rest and immobilization. In fact, if these things are efficiently carried out, most cases will recover in from three to five years with no other treatment except attention to the general health It is the one thing upon which I have come to depend. and all other treatment is used simply as an adjunct to it But right here I want to say that immobilization, to be of any value, must be efficient, and the reason it has failed in some hands and has seemed of doubtful benefit in many cases is because it has been inefficient. Remember that joint tuberculosis is a chronic disease have seen two or three cases, out of many hundreds, that I thought recovered in a year require three years, and most of them take from three to five years under the best of care. So bear in mind that when you put up a hip in plaster of Paris for two or three months, and then, because the pain and spasm have passed away, discontinue it, you have not used immobili zation Nor in case of Pott's disease, when you have sent to the instrument-maker for a spine brace, and allowed the patient to take it off at night, and finally throw it away when the straps wore out or the band broke, have you used immobilization. Nearly every physician seems to recognize the necessity of holding the joint still, because almost every case that comes to me late in the disease has at some time worn some immobilizing apparatus, but usually only for a short time So frequently I hear it said, "I took the cast (or the brace) off because I was afraid the joint would get stiff " No well joint is made stiff by immobilization, and a tuberculous joint will surely get stiff if it is not immobilized. In

other words, it is the disease, and not the immobilization, which causes the stiffness.

Immobilization, to be efficient, must be continued until the joint is well, and in cases of dorsal spondylitis I continue it long after I believe the tubercular process is cured.

While many cases of joint tuberculosis go on to marked deformity without much pain or spasm, a large percentage does suffer from both, and I know of no means of rapidly relieving the patient and overcoming the early deformity which is as efficient as traction in bed when properly applied But everything depends upon the method of application For the hip, the adhesive should extend from the upper third of the thigh to three inches below the foot, and there be attached to a spreader which is long enough to keep the adhesive from touching the malleoli. Then the adhesive is bandaged snugly to the leg, and the bandage sewed on inside and outside with a basting stitch to keep it in place. A cord is then attached to the center of the spreader and carried over a pulley at the foot of the bed, and from three to eight pounds weight attached to the cord, depending upon the patient's weight and comfort The weight should never be great enough to cause pain, but just enough to tire out the contracted muscles, produce relaxation, and thus relieve the pain. If there is any flexion deformity, the leg should be elevated on an inclined plane, extending from the buttock to the foot of the bed, high enough to allow the lumbar spine to he flat on the bed. When that is done. the pulley must, of course, be at the upper ends of the incline After all is adjusted, lift the foot of the bed about six inches to prevent the patient slipping down The same rules apply when traction is applied to the head for cervical or dorsal disease of the spine, except the inclined plane will not be necessary, and the head of the bed instead of the foot must be elevated. It is essential, too, in head traction, that the halter should be so adjusted that traction will be equal upon chin and occiput, or the patient will be uncomfortable The patient should be flat, without a pillow under the head, but with a thin narrow pillow made of a folded woolen blanket under the diseased vertebrae

When the pain and spasm are relies ed and the affected joint can be put into the proper position for permanent immobilization, the best frustion dressing for the first few months is plaster of paris. It is easily procured, and with a few precautions can be put on anywhere, by any physician, so as to be perfectly comfortable for the patient, and it can be made to immobilize any

joint more effectively than the best mechanical apparatus

Plaster of paris should never be put upon the bare skin nor over absorbent cotton. The best protection is a garment of spire-litting cotton underwear covered with a layer of sheet wadding. bandaged on firmly with a cotton roller bandage For the hip, the cast should extend from the tenth rib to the toes, for the spine, it should extend from the sternoclavicular articulation to the trochanters If the disease is above the eighth dorsal vertebra, the neck and chin must be included. These casts should be changed about once a month, to inspect the diseased joints and care for the skin. When all signs of progression of the disease have disappeared, and it seems evident that the process of repair has begun, it is safe to use some mechanical apparatus, though I lielieve that in the hands of one who is not skilled in the use of braces, the plaster of paris east is safer throughout the entire course of the ch-case, for the simplest brace will get out of order, and the parents become carcless in its adjustment, and unless a brace holds the joint tirmly fixed all the time, it becomes a burden instead of a brace, and does more harm than good

The simplest and most efficient space brace is the old anteroposterior leverage brace designed by Dr Farette Taylor It must be made from accurate tracines of the spane and polys made with the patient lying prone, and then must be carefully adjusted after it is finished, so that just the right amount of pressure is exerted on the transverse processes of the diseased vertebræ, as it must be remembered it is a leverage brace, and when it crases to act as a lever it is useless The so-called crutch braces, made with an upright tixed to the pelvis band, bearing crutches which lift up the patient's shoulders, are usiless unters the spinal uprights act as levers, and are constructed on an erroncous idea. The shoulder girdle is so loosely attached to the thorax that any pressure exerted by these crutches in the axilla sufficient to take any of the weight from the diseased vertebra would be unbearable to the patient. For the same reason all plaster jackets should be trimmed out under the axilla to allow the arms to hang normally and more freely is hyperextension of the spine that is aimed at in all apparatus for Pott's disease, not to lift the superincumbent weight, for by hyperextension the weight is shifted from the bodies of the vertebrae to the articular and transverse processes, and the pressure on the affected vertebra is thus relieved and with perfect comfort to the patient

For the hip there are two braces that have given great astifaction in my hands. One, the Judson long hip splint, is to be used with traction when the disease is progressive and when it is desired to let the patient wall, without enutible. The other is the Thomas hip splint, which necessitates the use of crutches the same as a plaster cost. The first is useful when the patient can be seen at least twice a month, and where the parents can be made to thoroughly understand its principles and depended upon to keep it accurately adjusted. The second is useful to maintain a fair amount of fration in cases which are beyond the progressive stage, or where the patient cannot afford the more expensive traction splits.

Bier's obstructive hyperamia, My experience with the so-called Bier's treatment or passive hyperamia has been disappointing; but I do not charge that to the mefficiency of the treatment, but rather to the mefficiency of the use of it. have only used the rubber bandage for producing the hyperxima, and have had no experience with the vacuum annuratus. Some cases may have gotten well sooner than they would without it, but the improvement is so slow that many patients get tired of applying the bandage two or three times a day for three or four hours and lev are willing to come to the office daily for a protracted period to have it applied. Those who have used it most persistently and accurately claim good results.

SURGICAL TREATMENT Regarding operative measures for tulk reulous disease, I can do no better than to quote from Sir W Watson Chevne in the preface of his book In preparing a second edition of my book on "Tuberculous Disease of Bones and Joints,' I have been much struck by the alteration which has been taking place in connection with the question of operative treatment. While there is very little to alter or add as regards the morbid anatomy and nathology of these diseases, there is no question that operative interference is very much less frequently employed at present than it was at the time when the first edition was published. When the tuberculous nature of these diseases was first demonstrated, the views as to the prognosis of tuberculosis were much more gloom) than they are at the present time, hence operation was very largely carried out with the view of attempting to eradicate the disease, as well as to obtain a good functional result Since that time, honeser, experience has been accumulating, and has shown that, with careful hygienic and local treatment, the outlook of tuberculosis, especially of the forms met with by the surgeon, is more favorable than was at that time thought, and the frequency of operations, especially at the early period of the disease and in the absence of supnuration, has been steadily dininishing."

The chief points to be considered in deciding whether to attack the diseased joint surgically are:

1. The age of the patient.

2. The local condition of the joint involved
3. The general condition of the patient as regards his resistance, and evidence of toxemia.

(a) Radical operations in children should be avoided, if possible, as it is certain to interfere with the later growth of the extremity, and the chances of recovery with good result under mechanical treatment and good by giene are much better in children than in adults

(b) In cases where there is extensive destruction, not only of joint structures but of bone, with probable sequestra and invasion of periarticular structures, operation looking to a general

clearing out of the infected area by clean incision into healthy tissue is undoubtedly warranted, and

especially if the patient is doing badly. Then again certain joints are notorously un favorable for mechanical treatment in adults, as for instance, the tarsus. I think it is a safe state ment to say that early amputation of the foot in disease of the adult ankle would be the most conservative treatment in 90 per cent of those cases, while in children the same joint shows remarkably good results under mechanical treat-

(c) We are all familiar with those cases seen most frequently in young adult life, in which there is no resistance to the disease, the early toxema is marked and profound, and the patient steadily and rapidly gross worse. In such cases the only indication is to separate him from his infected focus as completely as possible, even to the extent of amputation, and then give him the benefit of outdoor treatment, tuberculin, and every other possible measure to save him.

Much might be said about special procedures for certain joints. Excision of the articular surfaces of the knee looking to early analysios, has a strong advocate in Ely. Huntington would tunnel the trochanter and neck of the femur in all times. But, while these may all be of value in certain selected cases, it is very doubiful if they are advisable as routine methods.

ANTISEPTIC INJECTIONS

For several years the injection of antiseptic solutions into the affected joint and the surrounding tissues was a favorite procedure of some sur-

geons. The antiseptic most frequently used was indoform, supended in glycerin or oil. Like others, I tried it in a long series of cases, and have discontinued it. I remmer just one case, a knee-joint, where I thought it was helpful I know that the idea has been very generally accepted that iodine has more curature or inhibitive effect in local tuberculous infections than any other drug, but, after fifteen years' experience, and having given it faithful trail in various forms, I have come to the conclusion that I want to be shown, for I have never scen any evidence of it

Moreover, I do not believe it is a rational surgical procedure to inject an insoluble substance blindly into a tuberculous area, in the hope that it may hit a spot where it may do some good. Certainly if we stop to remember that in nine cases out of ten the primary focus of infection is in the bone, and not in the joint, and that, long before the joint becomes invaded and we get ready to inject, the disease has spread in various directions through the joint structures accompanied by granulation tissue,-if, I say, we carry that picture in our minds, we should certainly realize that a blind injection of judoform or any other substance into the joint has about one chance in ten thousand of ever reaching the deep-seated foci which are eausing the trouble. And unless we can reach them, what possible good can the injection do? There is just one class of cases in which I believe antiseptic injections may be useful, and I frequently use them, but I do not use rodoform Those are the primary synovial eases, -cen in young adults (twenty to forty years of age), and beginning as a subacute synovitis, with gradual swelling, little or no pain, and slight disability and limitation of motion. For such cases, if seen before the disease has penetrated the joint structures and invaded the bone, I inject a mixture of three per cent of formaldehy de solunon in olive od Formerly I used glycerin instead of olive oil, but glycerin is so hygroscopic and writating that I abandoned it for o'ive oil My experience with this has not been sufficient to warrant definite conclusions, but it seems to me that some cases have improved more rapidly than others have without it

COMPLICATIONS - ABSCESSES, SINUSES, AND SPINAL PARALASIS

Tubercular abscesses We have all of us been for so long inbued with the idea that all abscesses should be opened and drauned as soon as fluctuation is detected, that we have failed to see that a so-called tubercular abscess is not an abscess at

all, and that the rule did not apply. We have been a long time learning that a patient with a simple tubercular infection, though he may have an abscess a large as his head, is more fortunate and has infinitely a letter chance of recovery than a tuberculous patient with a mixed pyogenic infection added to his tuberculosis. We, who would never think of opening an uninfected kneejount or cystic timnor except under the stricesaction of cystic timnor except under the stricesta-epsis, and have always closed such wounda immediately for lear of infection, have cheerfully opened sterile tubercular abscesses, stuck in drains, and condemned the patients to dress inlected snusses for months or years, and thought we did good surgery.

I have seen scores of patients with large abseesers, so-called, who had little or no temperature, gaining weight and doing well in every way, and after the abscess was opened and drained have layer seen them lose weight, the temperature go up, appetite lail and the patient grow worse, and possibly the, from epitic infection. And I have

quit

I believe there are just as positive indications for opening tuberculous absresses as there are for any other aseptic operation, and that they should be opened only when those indications are present. While I have opened many such abscesses in the past eight years, I have enver drained them, and my results have been so much better that I have simply wondered why I ever did it before the properties of the

Indications When a tuberculous abscess is so situated or is so large as to interfere with mechanical treatment, it should be evacuated

When it is burrowing so rapidly as to threaten the integrity of subcutaneous tissues to any considerable event, it should be executed. When the patient has a persistent high temperature with indications of reviewin, and is doing bodly, if an abscess is present, it should be executed if the abscess shows signs of probable rupture, it should be executed. If secondarily infected, open and drain, and only then.

Technique. I never attempt to evacute such an abscess by aspiration or by puneturing with troat and cannula, because both methods are irrational and inefficient. Anyone who has ever seen the contents of a tubercular abscess, contaming cheey masses of various sizes, flakes of coagulated fibrin, and often small bomy sequestre, must realize that such can never be evacutated through a trocar, and those are just what must be expelled to do any good

I make an incision large enough to admit my finger, not at the most dependent site, but through healthy skin alongside instead of over the abscess

The contents are gently expelled and the cavity is gently washed out with normal salt solution, sterile water, or some mild antiseptic. When the water returns clear the fluid is all pressed out gently, and the edge of the wound is sponzed with bichloride and tightly closed with deep sutures. Then a large compress is snugly bandaged on so as to keep the walls of the cavity in contact as much as possible, and the patient is Lept in such a position as to prevent tension upon the line of incision until after it has healed. By this method we relieve the tension inside the abscess, allowing the walls of the cavity to collapse without infecting the cavity. I have become convinced that it is impossible to dress an open wound leading to such a cavity for morethan a week without its becoming infected, even under the most ideal hospital conditions. Sometimes this method of evacuation disposes of the abscess permanently, but usually they fill up again although not so full. They may have to be evacuated several times, each time becoming smaller, but it is far better for the patient to have it done a dozen times, as it can be done with local anæsthesia without pain, than to have it drained once and become infected

Smuser. What to do with old infected sinusleading to tuberculous bone foci, often discharing for months or years, has long been a puzzle to the surgeon. Constant irrigation with antiseptic solutions certainly does no good, and I believe does harm. Curretage is worse than uceless, as it simply exposes an intereased area of raw surface to infection. Open incision is futile unless if reaches and removes the foco of infection. So for many years I simply let them run, keeping the shan clean and depending upon Providence and the pattern's resistance to finally close them up, and if the pattent tived long enough they usually

did The introduction of bismuth paste a few years ago by Carl and Emil Beck promised a valuable adjunct in their treatment, and I believe it is in selected cases But it has not proven the miracle worker that was originally claimed for it I am convinced that its value is purely mechanical, and that a paste made with any insoluble mert powder will do exactly as well. A sinus is a collapsible tube, the cells lining it are macerating in the oozing moisture and being constantly washed away The paste dilates the sinus, keeps its walls separated, and supports the newly formed cells until they are sufficiently organized to hive, and perhaps stimulates by contact the activity of the indolent granulation tissue lining the sinus walls Its use in sinuses leading to large cavities is dangerous both from blocking up of the discharge and tovermia, and from bismuth possing. Emil Reck. has himself reported event acres of bismuth polsoning, and he legal of such experience it evens little short of eliminal to open large tubercular metassas and, after exacuation, mindful by some. It is in the old indolent across states of the property of the prope

When the interest in Wright's opsome treat ment was at its beight, two years ago, I had quite a large series of cases given the treatment with tuberculin after Wright's method. It was done by expert laboratory workers, who were trained by a colleague who had spent some time with Wright in his laboratory, and the cases were nearly all patients in St. Luke's and Cook County hospitals, where they could be kept under constant observation. In a few cases the rate of improvement seemed more rapid than it would have been by mechanical and surgical measures alone, in the great majority of cases it apparently in no way influenced the progress of the disease, while a few cases seemed to be made worse rather than better

Since abandoning the opsonic method of giving tuberculin, I have used it after the method suggested by Packard of Denver with more satisfaction. He advocates beginning with small does, small enough to produce no reaction, and slowly increasing it in those cases which are neither doing will not hopelessly badly, but those in which

the patient has good resistance but needs a little assistance to tip the scale toward recovery. Even in such eases, the first sign of a reaction is an indication to stop entirely for a while

Pott's paraplegia Paresis or paralysis affecting the lower extremities - the so-called Pott's paraplegia - occurs in about 10 per cent of all cases of tuberculous spondylitis It may occur early in the disease, especially when the middorsal spane is affected, but as a rule it is a later complication. It is due to an extension of the disease backward into the spinal canal, and pressure upon the cord by the exudate and the pachymeningitis which results. It may present any degree of paralysis, from weakness and inability to control the legs to complete paraplegia, involving the bladder and bowels. Sometimes, especially in dorsal disease, the spastic contractions are so constant and severe as to be very distressing to the patient. If the patient is promptly put to bed, with traction on the head, as described above for the treatment of the pain and muscular spasm, and kept continually in bed long enough, the paralysis usually disappears requires from six to eighteen months usually. but I have never seen a case in which recovery from the paralysis has not occurred where the treatment was kept up for sufficient length of

I shall dismiss the X-ray treatment of tuberculous joints by saying that, personally, I have never seen any benefit from it nor have I known anyone who has During the early enthusissm over the X-rays, many cases were reported of improvement and cure, but I tred it conscientiously in quite a number of cases without seeing any improvement, and gaze It up.

BOOK REVIEWS

CHIRURGISCHE OPERATIONALEHRE Edited by August Bier, Heinrich Braun, and Hermann Kummell Leipzig Johann Ambronius Barth, 1912

The appearance of any system of surgery under the editorship of filer, Braun and Kummell is of sufficient importance to attract more than passing mention. Anyone, however, who has an opportunity to examine it finds that the subject matter far surpasses in importance and value what is ordinarly found in such books, and that it combines the good qualities found in the finest type of German text-books with the cleamess and conceinests characteristic of the American surgical conceinests characteristic of the American surgical polyaning marks an epoch in surgical book hash

Volume II which is now appearing contains poperations upon the Breasts, by Kuttner, General Prechingue of Abdominal Operations, by Bier, Surgery of the Stomach, by Bier, Surgery of the Stomach, by Bier, Surgery of the Stomach, by Bier, Surgery of the Appendicus and Peritonits, by Sprengel, Operative Trestment of Appendicus and Peritonits, by Sprengel, Operations upon the Liver, Gall-Bladder, Pancreas and Spleen by Korte, and Hernia, by Sudeck Early Spleen by Korte, and Hernia, by Sudeck Early of these chapters is a real musterpiece, and the volume should be in the library of every surgeon who the library of every surgeon who the

German
Kuttner treats of his method of operating upon
the carcinomatous breast with extension above the
carcinomatous breast with extension above the
clavicle, and while he has not had particularly
successful results, he has found that by following
this up by X.-axy treatment be is able to prolong the
lives of his patients Especially to be commended as
his section which deals with the advances in surgery
of the thorax, in which he discusses completely operations upon the lungs which have been made for
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Kuttner discusses, in addition to the above, the various operations upon the thorax, pleura, lungs, mediastimum, and resophagus Each of the 250 pages which he uses in this discussion is worthy of careful reading. They contain many new points and numerous suggestions upon the old ones

The general technique of Bier is so well known in America that we read with much pleasure and pmfst the 200 pages in which he discusses the surgery of the stomach, with its relation to gastrostomy and operations upon the polyorus, and the extensive discussion of carcinoma of the stomach and the treatment of tuberculosis and syphilis

Schmeden's chapter upon the operations on the intestines, while a complete résumé of the subject and thoroughly satisfactory from the reading stand point, misses somewhat the personal equation which has made the other chapters of this volume so

interesting and valuable.

Korte has been so long connected with the subject of sall bladder that the student reads this chapter with special interest. In it are discussed operations upon the liver, tumors, cirrhous, and the operation ethorique of sall-bladder augery, as well as that of the splien and retroperational space. This discussion of Korte a is especially valuable because the splien and retroperation and the splien are spliently more abbreviated than the chapters by Kuttner and Bier, but still extremely valuable

Sudeck's article is a complete résumé of the various types of hernias with a clear and concise description of the technique of their cure

In general this volume of \$50 pages is printed upon good paper, with beautiful clear type and illustrations much superior to the average which appear in German text-books on surgery, many are in two colors. One may feel certain that this system will stand for many years as the guide to the highest type of German surgery.

THE SURCERY OF ORAL DISEASES AND MALFORMATIONS, THERE DESCOSES AND TREATMENT BY George Van Lagra Brown, D. D. S., M. D., C. M. Philadelphia and New York. Let & Febiger, 1912

This work fills a place as a text-book, and book of reference very much needed both by physicians and dentists. The author has had many years of experience as a teacher and practitioner and therefore is competent to show the relation of Cause and effect between general discusses of the nervous system and other organs of the body and the oral cavity and or the result of the nervous system to the succession of the body and the oral cavity and of the succession of the body and the oral cavity and to the succession of the body and the oral cavity and to the succession of the body and the oral cavity and to the succession of the body and the oral cavity and the succession of the body and the oral cavity and the succession of th

The work as a whole, is by far the best and most comprehensive of any apon the subject and is recommended to the general practitioner and specialistalike The typography, printing and binding show the

The typography, printing and binding show the greatest skill and both the author and publishers are to be congratulated upon the production of such a valuable work

Clinical Congress of Surgeons of North America

FOURTH ANNUAL SESSION CHICAGO NOVEMBER 10 TO 15, 1913



CLINICAL CONGRESS OF SURGEONS OF NORTH AMERICA

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THE FOURTH SESSION OF THE CLINICAL CONGRESS

THE fourth session of the Clinical Congress of Surgeons of North America will be held in Chicago, November 10 to 15, 1913.

Under the leadership of Dr E Wyllys Andrews, as Chairman, the Committee on Arrangements has organized and selected its committees and sub-committees as given below Several meetings of the general committee have been held and the enthusiasm of the members argues for a large attendance and a successful meeting

The general headquarters of the Congress will be at the Hotel LaSalle, where the entire eighteenth and nineteenth floors have been reserved for the main body of the Congress This affords the use of the large ball-room for the evening meetings, with the large reception room (Red Room) adjoining for registration purposes, and in addition we can utilize the large corridors, with smaller rooms for committee purposes This will provide an ideal meeting place, away from the noise and confusion of the streets and the jobbies of a large hotel

As it is confidently expected that the next session of the Congress will attract a larger number of surgeons than have attended any previous

session, it has been decided by the Committee on Arrangements to provide a separate meeting place and headquarters for the Section on Surgery of the Eye, Ear, Nose and Throat The entire second floor of the Hotel Sherman has been reserved for this purpose This will afford suitable registration rooms and a place for holding evening meetings for this branch of the Congress. A canvass of the facilities of the several hos-

pital ampitheaters and other places for giving chnics demonstrates that Chicago has an abundance of room and that more than 2500 surgeons can be comfortably accommodated at all hours of the day In addition there are accommodations for fully 600 eye, ear, nose and throat surgeons. When the plans are more completely developed it will be found that there are ample accommodations for a very large number of men

While the hotel accommodations of Chicago are ample, experiences at the New York and Philadelphia sessions demonstrate that it is wise for all those who anticipate attending the Congress to make reservations in advance. In the April issue we expect to publish a pre-

liminary clinical program

3

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Surgery of the Nose and Throat
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Arthur Dran Bevan Caser Wood

Historical Committee
Mortiser I rane. Chairman Otto Schuidt
Grouge Weaven

CLINICAL CONGRESS REPRESENTATIVES IN OHIO ORGANIZE

At a meeting of the Ohio members of the Clinical Congress of Surgeons of North America, held on the Congress of Surgeons of North America, held on the Congress of the Congress of the charge laws of the Congress of the Congress of the representatives, the temporary organization became a permanent one. An executive commission became a permanent one, and executive commission plans for the holding of state meetings, and given power to act. The committee consists of the following members:

Charles Gracie, Pre-ident, Sandusky; George M. Todd, Secretary, Toledo, George W. Crile, Cleveland, C. A. Hamann, Cleveland; C. A. L. Reed, Clincinnati, Charles Hamtlon, Columbus, Ben McClelland, Xenia; L. G. Bowers,

Dayton.

The executive committee held a meeting on Saturday evening, February 21, at the residence of Dr. George W. Crile in Cleveland. Dr. Franklin H. Martin, general secretary of the Congress,

was present.

Cleveland was chosen as the first meeting place, the dates selected being Monday and Tuesday, March 17 and 18. It was not definitely settled, but the headquarters probably will be at the Statler Hotel. There is to be a local programme committee appointed consisting of members from the hospital staffs. There will be a fee of two dollan charged. A ticket will be given to each registered member which will be given to tach registered member which will admit him to the clinics. To provide against overcrowding ome clinics and to help distribute the members there will be special tickets issued for some of the clinics. All of the hospitals will

hold both surgical and diagnostic clinics. The clinics on the first day will be from 10 to 10 clock and from 2 to 40 clock. At 5 there will be a meeting of the house of representatives to elect representatives and to nominate two candidates for each office to be filted. The general meeting will be held at 8 o'clock in the evening to elect officers, to select a meeting place, etc. After the business meeting there will be the clock officers will be the continuous officers of the continuous co

All physicians are invited to attend Cleveland surgeons and diagnosticians are going to give their best, which will be a guarantee of quality. Social festivities will be tabooed It is to be strictly a working association.

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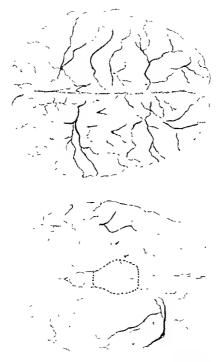


Plate II Streptococcic meaningsis Dearange of the easterns magna. Later autopose would indicate that the area wafns the detect lines is not affluenced by this draining (filturrature article on Indications for and Results of Operative Treatment of Orice Wannights' b) Lucous W Day 1.

SURGERY, GYNECOLOGY AND OBSTETRICS

AN INTERNATIONAL MAGAZINE, PUBLISHED MONTHLY

VOLUME XVI

APRIL, 1913

NUMBER 4

THE FŒTAL PERITONEAL FOLDS OF JONNESCO, TREVES, AND REID,
AND THEIR PROBABLE RELATIONSHIP TO JACKSON'S
MEMBRANE AND LANE'S KINK

By JOSEPH RILUS EASTMAN At D., INDIAS APOLIS

I T is the purpose of this paper to call attention to the striking similarity of the fotal pertioneal fold described by Jonnesco and Juvara. and designated by them "the parietocolic fold," to the adult peritoneal anomaly described by Jackson as membranous pericolitis, and generally known as "fackson's membrane".

Hofmeister gives credit to Virchow for the first description of this membrane as found in the adult Binnie, Lane, Hofmeister, Coffey, Connell, Crossen, Flint, C H Mayo, Pilcher, Gerster, F H Martin and Hall have all contributed to the present knowledge of this matter by reports of cases, many of these having submitted hypotheses to explain the origin of Jackson's membrane Jackson's early articles were met with hesitating credulity on the part of many who, if they admitted the fact of the existence of these membranes, ascribed their presence to simple inflammation and adhesion formation. Such a view could find very few supporters now It is the further purpose of this paper to

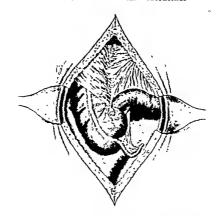
call attention to the probable causal relationship between the bloodless fold described by Trevest and a pocket-like anom-

alous peritoneal reflection, which is not rare in the adult and which passes from the mural perstoneum upon the right side quite low down, extending upward and inward over the caput coli and vermiform appendix, to be attached to the last two or three inches of the sleum and to the peritoneum of the caput coli It forms the boundary of a precolic fossa in which the carcal head and the appendix may rest as in a pocket. It is likely that the caput coli with the appendix are, not rarely during operations for appendicitis, shelled out of this peritoneal pocket, the peritoneal fold, that is the bloodless fold of Treves, which forms the pocket being looked upon by the operator as an affair of adhesion formation.

adhesion formation.

Moreover, although conceptions of Lane's licopelvic band, the structure to which is icopelvic band, the structure to which is ascribed an important part in the causation of Lane's kink, are somewhat varying, it may be well in discussing the nature and origin of this band to recall that Douglas Reid, of the University of Cambridge Medical Control of the state of the state

Anatomie des ligaments de l'appendice vernuculaire et de la fossette life-appendiculaire. Le Frog. Med. aux 273
 The Anatomy of the Intestnal Canal and Pentemeum in Man Hunterian Lecture 1855



lig t Parietocole fold of Jonne co and Juvara, found in about 20 per cent of fectuses after the exalt month

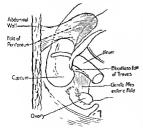


Fig. 2. Diagram after Douglas Reid, showing the pame tocolic fold crossing in front of the ascending colon.

fectures after the seventh month, or even after birth at term, the question may be fairly raised as to whether it is not related to angulations or gravitations or other deformities of the terminal ileum to which it is attached

The parietocolic fold of Jonnesco and Junara in most cases arises from the peritoneum at the left or inner side of the ascending colon, passing over the anterior aspect of the ascending colon in an upward slanting direction. It is attached to the parietal peritoneum at the right of the ascending colon. It may adhere to the anterior and alternal aspects of the colon. Reid (bid) ascribes to this fertal fold particulally the same relations as are presented by the parietic colic fold or Jackson's membrane when found in the adult (Figs. 1 and 2).

By courtesy of Dr H R Alburger, pro-

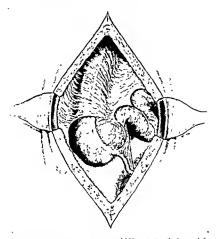


Fig. 3. An extensive paractocolic paratoneal fold constructing the lumen of the ascending colon. Condition found in a fortus seven months old.

fessor of pathology in the Indiana University School of Medicine, 28 feetuses were examined in the course of preparation of this paper All of these had passed the sixth month, and varied in length from 12 to 32 cm In the series of 28 foctuses, 5 presented the panetocolic fold Reid found it present in 3 out of a series of 20 feetuses, or in about 15 per cent of the foetuses examined In a feetus 20 cm in length, I found a parietocolic fold which enveloped the ascending colon in such a manner as to constrict it to less than one half the transverse diameter of the caput coli which bulged forward, balloon-like, below the grasp of the encircling peritoneal fold (Fig 3) Observing that the blood-vessels of the parietocolic membrane continued over on the mural peritoneum, it was recalled that Hall, in his report of an examination of one of Jackson's first cases of membranous pericolitis in the adult, noted also that the blood-vessels of the parietal serosa were continuous with those of the anomalous membrane which enveloped the ascending colon.

In a fectus at term (Fig. 4), a parietocolic membrane was found which began at the inner side of the ascending colon and passed around to the front of the colon, where it branched, the larger leaf passing downward, spreading web-like along the colon and spanning the concavity of an ebow-bend in the colon, the sharp free edge of the membrane being upon the inner or left side. It was

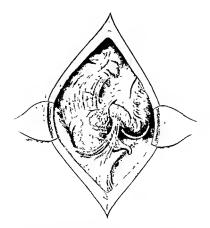


Fig. 4. An unusual form of panetocolic fold of Jonnesco and Juvara above. The bloodless fold of Treves shown below appeared in the same specimen, a fortus at term

suspected that the flexure of the colon referred to was due to the presence of the membrane which passed from one limb of the elbow to the other. The bloodless fold of Treves was also present in this case.

In a fectus 22 cm in length (Fig. 9), a webble peritoneal covering was found upon the ascending colon, which passed over upon and was continuous with the serosa covering the great omentum This membrane was closely adherent to the serous covering of the ascending colon, as if the layers had become fused together

In a feetus 17 cm in length, Reid found the posterior (direct) and the anterior (reflected) lamina of the great omentum firmly adherent, and the posterior (direct) lamina fused

completely to the colon In the first case of so-called "membranous pericolitis" in the adult which I operated upon, the web-like anomalous peritoneal membrane fused with the serosa of the ascending colon, as described above The veil like membrane could not be removed without taking with it the normal peritoneal covering of the colon, thus leaving the latter raw and hleeding. In this case the web-like peritoneal membrane passed over on the gastrocolic omentum (Fig 6) Whether this was a case of actual fusion of the two peritoneal layers of the omentum with the peritoneal surface of the colon was not proven. This was owing to the circumstance that the author was not aware at that time of the fact of the occasional

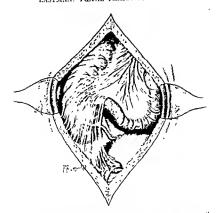


Fig. 5. Extensive bloodless fold of Treves passing over excum to mesocaccum, the inner border of the fold connecting the terminal ileum with the genital gland

existence of such a relationship states that "when the rotation of the gut is complete the mesogastrium balloons forward and the formation of the great omentum This fuses later with the transverse colon and the gastrocolic omentum thus comes into existence. Usually this fusion takes place only along the transverse colon, establishing the usual relationships infrequently the omentum attachments extend farther to the right, even to the abdominal parietes " Thus it will be seen how the two peritoneal layers of the great omentum unseparated by fat may come to lie upon the serosa of the ascending colon as well as upon the transverse colon

To return to the parietocolic peritoneal fold of Jonnesco and Juvara. This membrane, in the five cases observed, could readily be separated from the underlying colic peri-

Bull Johns Hopkins Hosp xxiii 260

This is true of many cases of lackson's membrane, and this would hardly be the case were it a product of membranous pericolitis alone, as suggested by Jackson, or of mechanical irritation alone, as indicated by Martin Concerning the origin of Jonnesco's fold, we have found several succeeding stages of its formation which indicate that adhesions may form between the serosa of the cocum and the mural serosa while the cæcum is still subhepatic The subsequent descent, with torsion or rolling inward upon the long axis, draws the parietal serosa over in front of the ascending colon in a slanting or spiral direction. like a ribbon wound spirally around a rolling cylinder. In 28 feetuses examined, the bloodless fold

of Treves was found 9 times (Figs. 7 and 8). It passed from the lateral posterior parietal peritoneum to the terminal part of the ileum

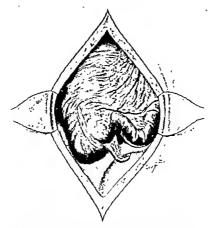


Fig. 6. Anomalous personneal covering of the ascending colon formed by lusion of the normal personnum of the colon with the anterior and posterior laming of the great omentum.

and the caput coli, fusing with the peri toneum covering the intestine. It was always more or less fan-shaped, the broad attachment being to the mural peritoneum The intestinal end was always the more nar-It formed a pocket in which the vermiform appendix and more or less of the caput coli and coccum were ensconted This fold is described by Douglas Reid as follows "Passing from the mesenteric border of the appendicular excum and from the nonmesenteric border of the last part of the ileum to the posterior and lateral abdominal wall is a sheet of the peritoneum forms the anterior wall of a fossa completely closed save below Its orifice is bounded in front by the free lower edge of the peri-

toneal sheet, medially by the ileum and the adhesions which bind this down, and posteriorly and laterally by the parietal pertoneum."

It will be seen from Fig. 9 taken trom Red, that the bloodles lold of Trees may adhere to the abdominal wall and resist for a time the completion of excel torsion. It does not seem illogical to assume also therefore, that the lower mner border of the bloodless fold of Trees may reset the drawing upward and inward of the last part of the lieum, thus preparing conditions favorable to the formation of Lane's kink, or actually causing it. Keeping in mind the attachments of the bloodless fold of Trees before excel torsion or internal rolling upon the long

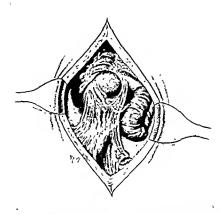
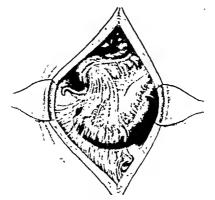


Fig 7 The bloodless fold of Treves. The inner border passed from the terminal item to the genital gland, corresponding in its position to Reid's gentlo-mesenteric fold and Lane's stepolyto band as seen in the adult.

axis has taken place it is not difficult to understand how the execum covers itself as it turns over with this sheet of peritoneum, just as a man rolls himself up in a blanket

In Huntington's "Anatomy of the Peritoneum" (p. 241) will be found a description of cavcal torsion "When the cavcum has come down from its hepatic position, the terminal colls of the ileum pass from right to left behind the excum to enter the colon, and the concavity of the cavcal pouch is directed upwards and to the right. After the final act of rotation has occurred, that is, after the cavcal torsion has taken place, the ileum enters the large intestine from the left and from below, and the concave border of the execum is directed to the left. This change in relative position has been accomplished by a revolution of the colon and excum through an arc of 186° around its own long axis, carrying the excum above and behind the small intestine and bringing it into contact with the dorsal prerenal parietal peritioneum. At the same time the terminal coils of the ileum turn downward and to the left. If this final step in the rotation of the large intestine fails to occur, with other wise normal development of the parts, the ileum will persist in entering the large intestine from right to left after the excum has obtained its final lodgment in the right iliac fossa."

Reid speaks of two cases in which the parietocolic fold is formed by a large appendix epiploica. The presence of the parietocolic fold and of the bloodless fold of



high A hourst fan shaped blooden fold of trever covering a hope of the ilium

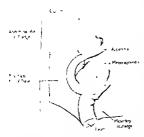


Fig. 0. Diagram after Douglas Reid showing the attach ments of the bloodless fold of Trees and the possibility of this fold reasting ereal torsion.

freve might be explained by assuming that before caval torsion takes place a large appendix epiploica or several appendices epipleace become adherent to the parietal peritoneum and clongate and spread out as the colon rolls over from right to left It is difficult to understand how an adhesion between the colon and the mural peritoneum could excur except through an appendix eniploid, inasmuch as before creal torsion is complete the colon and mural personeum are separated by coils of intestine which he en front of the colon below that part which is covered in front by the liver. At the right side lies the appendix, which, it should be noted, is proportionately very large in the feetus. It forms a loop at the side of the colon and cacum. The appendix with the me-o appendix completely separates the colon from the peritoneum at the right lateral alidominal wall Reid remarks that at this stage of excal torsion it appears to be

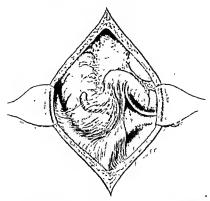


Fig. 10. A broad bloodless fold of Freves forming a pocket in which are ensconced the caput coli and appendix

impossible for any adhesion to form between the colon and the lateral abdominal wall excepting through the medium of an appendix epiploica. Contemplation of an appendix epiploica in the adult would certainly furnish an erroneous conception of the length and width of the fortal folds here considered Reid's remarks concerning the possible role of appendixes epiploica in the formation of these folds take the form of intumations only the does not leave the impression that he would claim to have cleared up this somewhat obscure matter

Whatever the origin of these folds in the fectus, there will be no doubt in the nund of anyone who will examine the region of the caecum in a few fectuses that they exist before birth and are readily demonstrable in one form or other in approximately 20 per cent of fectuses after the sixth month. The fold of Treves was present in a larger percentage of cases.

If we admit that the bloodless fold of Treves is a reality, and that there is no error as to its being attached, as described, to the ileum and excum, and if we admit that excal torsion after such attachment is a fact, then there should be no surprise, in view of the frequency of the appearance of Treves' fold in the foctus, that occasionally we find the caput coli in a peritoneal pocket in the adult I have shelled the caput coli and appendix out of this pocket in operations for so-called appendicitis several times (Figs. 10 and 11) The caput coli does not fit loosely into the pocket There seems usually to have been a more or less successful attempt at fusion of the bloodless fold of Treves with the caput coli and appendix, so that it is necessary to dissect out bluntly the appendix and carcal head, chiefly with a Mayo's blunt scissors.

Jackson's membrane is as yet indefinitely described Its location is not constant

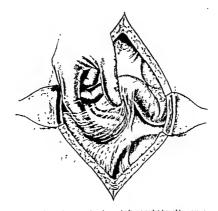


Fig. 11. Shelling the caput coh and appendix from a pocket formed by a perusting binodiess fold of Treves

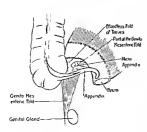
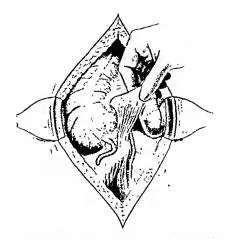


Fig 12 Diagram after Reid, showing the genitomesenteric fold

Without doubt membranes have been designated "Jackson's membrane" which Jackson would not have embraced under the name "membranous pericolitis" However, I know that some of my colleagues have looked upon as a Jackson's membrane what was, in view of evidence now at hand, certainly a persist ing bloodless fold of Treves, which held the caput coli and appendix as in a pocket of a shirt I have found the bloodless fold of Treves to be present, not only in cases presenting, generally speaking, the symptoms of chronic appendicitis, but in two instances in the course of operations which did not concern the intestine at all In both of these cases the last part of the ileum was drawn downward in a slight degree But the persisting fortal fold was lax, and there had been no symptoms of Lane's kink

The fold which was described by Douglas



lig 1. Shows the granto measurer, fold of Reol as it was observed in an adult during an operation for a petus lesion upon the opposite ode. This permitting first lold which produced no emptors is given beyond it han his called the deeped it band.

Rad and called by him "the genito-mesen tern (old 'passes from the mesentery of the bast part of the ileum down into the pelvis, being attached in the feetus to the genital gland below (Fig. 12). It will be seen, therefore that it has a scondary connection with the ileum and, through the peritoneum of the meso-appendix with the appendix itsell a connection which perhaps is responsible for the frequent association of appendicitis and ophoritis (Reid). I have seen this fold in the adult (Fig. 13). By lifting the last part of the ileum upward, a thin fold of peritoneum which was quite loose could readily be seen passing from the mesentery of the

Last part of the ilcum over the brim of the nelvis, to the region of the ovary There was no sharp border of this fold upon the right side It suread out on the right into a rather narrow fold of Treves Reid describes this cenito-me-enteric fold as passing under the appendix, whereas the fold of Treves passes over the caput coli and appendix However. in our cases, the inner or left border of the bloodless fold of Treves has ended in each case below in the genital gland in the feetus, at the ovary in the female after birth, and at the intra-abdominal ring in the male at Perhaps we have not seen the genitomesenteric fold as it was seen by Reid



Fig. 14. After C. H. Mayo, showing Line's deopolise band in the adult. Note the resemblance between this Lane's band and the factal fold of Douglas Reid shown in Fig. 14.

Certainly we have not seen it as a separate distinct fold, but rather as the more prominent edge of the bloodless fold of Treves, passing from the terminal ileum to the genital gland. It is thus gento-mesenteric fold of Reid, or the promment inner border of the fold of Treves, as the case may be, which corresponds in its position and attachments to the ileopelvic band of Lane. The relationship between the fectal fold and Lane's band is, perhaps, only suppositional but it seems not unlikely (that they are identical (fig. 14)

Reid has further drawn attention to adhesions of the colon to the peritoneum of its own mesentery I have seen in operations upon the adult the peritoneum of the mesen ters of the ascending colon reflected apward and adherent to the colonic peritoneum for a distance of five inches Byron Rohinson noted this form of adhesion I have ob served it twice in the adult (Fig. 15), it was unassociated with evidences of inflammation As it was seen by Reid in the fœtus it is fair to suspect this reflection of the mesenteric peritoneum of being a persisting feetal ad hesion. We have here strong presumptive evidence that Jonnesco's fold is due to adhesion, with subsequent rolling inward or normal cæcal torsion

Concerning the relationship of the folds of Treves and Jonnesco to Jackson's membrane, it may safely be stated that not all anomalous Morphology of the Digestive Tract J Amat & Physiol Remail



Fig 15 Adhesion of the peritoneum of the ascending colon to the peritoneum of the own mesenlery. This suggests an adhesion before excel torsion took place Subsequently, as the excum rolled over, the peritoneum of the mesocolon was nulled un

membranes which have been designated as Jackson's membrane are persisting fortal folds as described above The explanation which C. H Mayo gives of the origin of Jackson s membrane, which is, in effect, that after the peritoneum has formed, the rotating cæcum, coming down from its subhepatic position, pushes ahead of it an extra covering of peritoneum, is about the only hypothesis by which we can explain that form of lackson's membrane which encloses the cacum and ascending colon as in a bag explanation has been corroborated by those who have made studies of the peritoneum in the feetus, the differences in conclusions being largely differences of language Mayo spoke of "burrowing of the crecal head" under mural serosa as it descended and rolled inward, whereas adhesion formation while the cæcum is subhepatic with subsequent descent and internal torsion seems best to describe our impressions However, fœtal peritoneal reflections, folds and adhesions

are so numerous and varying that it requires no great stretch of imagination to think of the descending excal head catching under loose reflections, and actually burrowing under them, as suggested by Mayo, after the manner of a descending hernia

The principle of mechanical irritation, the result of visceral gravitations, to which I' H Martin ascribed a part in the production of membranous perioditis, is, without much doubt, an important associated factor Tilcher's view, which considers it the result of long continued and oft-repeated mild infections of the pertioneal coverings of the execum and appendix transmitted through the intestinal wall, and that of Gerster, which attributes the membrane to peritoneal reaction to infectious processes associated with chronic coltus, fit in well with the ex

planation of the embryonal origin of these membranes presented by Flnt (jibd), since their fusions, adhesions and contractures are doubtless directly or indirectly due to inflammation. It is highly probable that mechanical irritation and inflammation are important immediate or exciting causes of the chinical states embraced under the terms "membranous pericolitis" and "Lane's kink." The final solution of the problem of the origin of Lane is kink and Jackson's membrane will in our judgment, be represented by the sum of the views of Flint, C. H. Mayo, Lane, Jackson, Connell, Pil.

cher, Coffey, Binnie Gerster, and Martin In the meantime however, much information of value can be gained by a study of the foetal peritoneal folds of Jonnesco, Treves, and Reid

and Kelu

ETIOLOGY OF LANE'S KINK, JACKSON'S MEMBRANE, AND CÆCUM MOBILE

BY P. GREGORY CONNELL, M. D. Gerkosti, Wisconery Attending Success St. Mary & Hospital

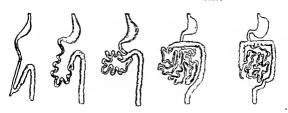
THE general acceptance as chincal entities of the above enumerated conditions has led to much speculation and theorizing as to the etiological factors that may produce such results. These explanations may be roughly divided into inflammatory and non-inflammatory, differentiation between their may at times be difficult because of the fact, which has not been sufficiently emphasized, that inflammatory reaction occurring either as a result or as an independent coincident may leave resultant adhesions that might confuse the question of etiology.

I will confine my remarks to a consideration of the non-inflammatory factors, which offer a rational explanation for typical examples and may be either acquired or congenital. The acquired is best exemplified by the theory of Lane (t) that these bands are crystallizations of lines of force in Nature's attempt to correct pitosis of the colon.

A combination of both the congenital and acquired factors is presented by Martin (a), who calls attention to the long continued traumatism of the comparatively fixed portion of the terminal fleum by the overriding of the abnormally movable colon and other superimposed visera. The congenital theory suggested by Mayo (3), that the excum descends behind the posterior parietal peritoneum instead of in front, has not met with general acceptance.

The following explanation, based upon the theory of imperfect development, I first presented before the Chicago Gynecological Society on February 23, 1912 (4) Since then observation of cases of this character has given considerable support to this theory, as have fikewise the publications of J M Flint (5) and Gray and Anderson (6)

In order to understand the probable developmental faults leading to these conditions it will be necessary to review the normal de-



Migration and rotation of excum in normal development

velopment (Figs. 1-5, from Huntington), during which the ileo-cecal junction migrates from below upward and to the left to form the splenic flexure, crosses the abdomen to the henatic flexure, where it rotates on its long

axis, descends, and is fixed in its normal, i e usual, location in the right iliac fossa

F12 2

In the available literature this most complicated embryological maneuver is spoken of under the caption "Rotation of the Caccum," and it is in a large measure due to this use of a single term to describe these various changes that there has arisen considerable confusion regarding this matter. On clover analysis one finds that this so-called rotation is comprised of three definite and distinctly different elements, viz, migration rotation, and fixation

Fig 5

By migration will be meant the journey of the iteo-cecal junction up, across and down the right side of the abdominal cavity (Figs-

1-5)
The term rotation will be confined to the actual axial rotation of the ileo excal junc-

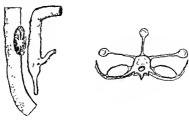


Fig. 6. Fig. Relations before fixation of ascending colon

tion through an angle of 180 degrees in a direction from above downward, backward, and forward (Figs. 3 and 4).

By fixation is meant the blending or fusion of the posterior layer of the visceral perito neum of the colon and the primitive mesocolon with the precenal primitive parietal peritoneum, by means of which the advantages gained by the migration and the rotation are retained, and the flee creat junction is held in its normal and desirable location in the right tilac fossa (Figs. 6 and 7, before fivation, Figs. 8 and 0, after fixation)

We have here reviewed the usual, the natural or normal development of the ileo caecal junction, and are now ready to consider its

posible anomalies

ANOMALIES OF MICKATION

Migration may be (a) incomplete or (b) delayed

(a) Incomplete migration With arrest of migration in its transit across the abdomen there will be an absence of an ascending colon and an incomplete transverse colon. This may occur at the hepatic flevure either before or after its fixation (Figs. 3 and 4). If before fixation, the ilec-exceal junction may fall back to the left linar fossa (Fig. 16). This condition is unusual, but will account for some of the authentic cases of left-saided appendicities.

in which the viseera are not transposed. After fixation, the transverse colon will be complete, but there will be an absence of the ascending colon. Such cases are not uncomon, I have met with one (Fig 11), and Mayo (S). Flint (9) and others report similar conditions.

The commonest arrest of migration occurs at any point between the hepatic flexure and the so-called normal location in the right iliac fossa (Figs 4 and 5)

(b) Delayed migration The cacum may be in its usual location, descent having been complete, yet there may be evidence in sunport of the supposition that such descent has The evidence will consist of been delayed adventitious bands or membranes extending from the prerenal parietal peritoneum downward and forward to the anterior surface of the colon i e a pericolie membrane, being probably the expanded or stretched line of primary usion which had taken place while the colon vas still in an undescended or subhepatic position Fig 12 shows the formation of a membrane in such a manner and is taken from the most instructive monograph of Flint (5)

ANOMALIES OF ROTATION

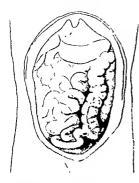
These may be (a) non-rotation, (b) excessive rotation, or (c) reversed rotation

(a) Non-rotation is most common with in-





Fig 8 I Ig Relations after fration of the ascending colon



lig to Arrest of migration before rotation or develop ment of hepatic flexure with absence of transverse and as cending colon

complete migration before the development of the hepatic flexure (Fig to) It may likewise. but less frequently, persist after the formation of the henatic flexure and the a-cending colon In such instances the terminal ileum enters the calcum from behind or from the lateral the right side instead of from the median or left aspect of the cæcum, and may lie in contact with parietal peritoneum and fuse in such relationship as to cause subsequent obstruction the Lane kink Huntington (7) and Kelly (10) each report cases of this type, Stewart (11) mentions two, and personally I have encountered this anomaly twice (Fig. 13), in both of which there was a Lane kink with cacum mobile

(b) Excessive rolation, that is rotation in a normal direction but of more than 186 degrees, even as much as 270 degrees, results in the ileum entering the cacum from before backward, instead of from the left or median aspect as is usual Fusion between such apposed visceral and partietal peritioneal coats



Fig. 11 Arrest of migration after rotation and development of hepatic fluxure with absence of ascending color

will result in treation of the colon and terminal ileum in abnormal positions (Fig. 14) Such a condition will probably persist until

Such a condition will probably persist until the bowel functionates and the erect posture is assured then as the execum and the terminal ileum contain contents which allow gravity to exert a pull the tendency will



I sg 12 Showing development of pericolic membrane (fluit)

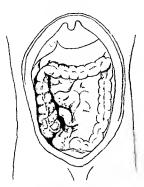


Fig. 13 Non rotation with complete migration

be for the ileo-cacal junction to return from its exaggerated rotation and assume its normal



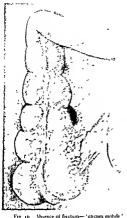
Fig. 14 Normal inigration, with excessive rotation and fixation



Ing 15 Exaggerated rotation of I ig 14, corrected by return to normal rotation

relations (Fig. 15). By so doing the lines of scrous fusion previously formed will stretch and form a membrane or veil on the colon that will accurately fulfill the detailed description of the periodic or Jackson membrane, and the fusation of the terminal ileum that will simulate the Lane kink.

(c) Reversed rotation in which rotation takes place from above forward and downward instead of from above backward and downward. would result in a kink at the hepatic flexure, a kink in the terminal ileum, and in the ileocaecal junction and the appendix becoming entangled in the primary mesentery in such a manner as to readily suggest the Jackson membrane, the Lane kink, or structures that might be called "adhesions" That a reversed rotation might occasionally take place seems quite plausible, for as Ifuntington says "The apex of the cocum is lrequently embedded among these terminal coils of the ilcum," yet in the examination of a large number of ileo-caecal junctions in which one or more of these conditions were present. I have been unable to find satis-



factory evidence of any such reversed rotation having taken place

ANOMALIES OF FINATION

(a) Absence, complete or partial, (b) early (c) of improper surfaces

(a) Complete absence of fusion between the parietal and visceral peritoneum of the ascending colon and mesocolon will result in the socalled careum mobile (Fig 16) This is quite common and may be accounted for by late rotation in which coils of ileum prevented the apposition of the surfaces that usually fuse. With incomplete absence, such as normal fusion of the upper third and absence below, the mobility will be less marked, if present in the upper two thirds and lacking in only the lower third, the result will be approximately normal Tusion of the lower portion of the colon, with absence at



the upper part may result in an angulation and in marked cases will show the characteristic "double-barreled colon, of which I have met with three typical examples (Fig 17)

In such cases adventitious ligaments, bands, or membranes are often seen, which may be belated, ineffectual attempts on the part of nature to hold the viscera in its proper posi tion, or may be due to secondary change, due to the stasis caused by the angulation

(b) Early juxation before the complete descent of the ileo-caecal junction, has been considered in the discussion of delayed migration

(c) Fixation of improper surfaces, of normal and of excessive rotation, have been considered in the discussion of delayed migration But even with normal migration and rotation, the usual fusion which ceases at the lower margin of the ascending mesocolon may become excessive and with either normal or defective fusion above this point, extend a greater or less length along the terminal ileum. causing a condition necessary for the development of the so-called Lane kink

The theory of Gray and Anderson and of M Flint, that the Jackson membrane is the right margin of the great omentum, which during development becomes adherent to the dorsal parietal peritoneum opposite the flexure and along the outer side of the ascending colon for a varying distance, is another example of fusion of improper surfaces Sub-equent de scent of the cacum may give to this portion of the omentum the characteristics of the pen colic membrane, and seems to be a very rational explanation, and without doubt this is what takes place in certain of these cases As to the primary cause or causes of these various abnormal or defective developments (that is, in cases of abnormalities such as exstrophy of the bladder, cleft palate, lack of fusion of the funicular process in hernia etc.) we are, as yet, entirely ignorant, but a de finite understanding as to whether these conditions are due to inflammatory or devel opmental factors is of the utmost importance from the standpoint of proper and rational treatment

CONCLUSIONS

Anomalous development offers a rational explanation for these conditions

- 2 Coincident or resultant inflammation may cause confusion
- 3. Describing the embryological changes in the ileo-caecal region under the single term rotation" likewise causes confusion.
- 4 Such changes are migration, rotation, and fixation, one or more of which may be imperfect
- 5 The Jackson or pericolic membrane may
- he due to excessive rotation delayed migra tion or early or anomalous fixation 6 The Lane kink may be due to excessive
- or anomalous fixation
- 7 The cæcum mobile is due to an absence of fixation

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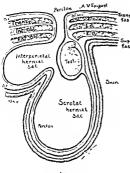
BILOCULAR HERNIA

BY V L SCHRAGER M D, CHICAGO N operating upon inguinal or femoral

hernias one occasionally encounters I more than one sac on the same side Such was the case in two patients operated upon by Dr D D Lewis, in his chinic at the Presbyterian Hospital purpose of this paper is to bring forth a new theory as to the mechanism of the double A search through the literature has not revealed a single case in which the patho genesis of the double sac was similar to that of Dr Lewis' case

By bilocular or multilocular hermal sacs we understand the presence of two or more sacs in the same inguinal or femoral herma, the nouches communicating with one another Properly speaking, a double sac is merely a division of one sac A. B Schmidt2 puts it, there are no double or multiple sacs, just as there is no absence of sac, occasionally alluded to Sacs made up of several concentric layers like the leaves of an onion, were described by several of the older writers Dieffenbach, Gunther, and Pitha, among others, described sacs with eight or ten concentric layers This type of sac is not included in our description Considering the complex terminology given

Destsche Zestschr J. Chr., xlvn D. 120



i se i to double sac hermas one is tempted to accept the suggestion made by Movnihant in 1900 I think that all these forms of hernias might with advantage be included under the title bilocular herntas " A bilocular sac is made of two communicating pouches situated in the inguinal, occasionally in the femoral canal while the other protrudes either between the transversalis fascia and peritoneum (properitoneal hernia) or betwen the layers of the abdommal wall (interstitial herma) or it may be located between the skin and the fascia of the external oblique (inguino superficial herma) All of these types of bilocular hernias could be well covered by

great many features in common and though described separately could be embraced in

hermas are right-sided because the vaginal process remains more frequently patent and the testicle descends later on that side. In a large majority of such hermas, the testicle is either undescended or shows evidence of

They have a

Most interparietal

some malformation. Fig. 1 shows, in a schematic manner, the mechanism of the usual type of biloculation, one sac being in the scrotum, while the other is forced laterally, being blocked by an undescended testicle.

HISTORY OF OUR CASES

6 K Greek, age 42 Admitted to the Presbyteran Hospital January 13, 1911, discharged January 26, 1911 Jour months prior to his admis sion to the hospital he jumped from a wagon. Two days later he noticed a swelling in the right group Work a truss since Had, at times, some discomfort but no appreciable pain. Operated by Dr. D. D. Lears The usual herma incision was made. After incroing the fascia of the external oblique, a sac of a direct type was detected. It was freed as far as possible toward the abdomen and then opened ti contained a piece of fat. The sac was transfixed and tuel off A second sac also of a direct type, was found medially to the first one. This was also freed opened and transfixed. It also contained fat. The sac was unimately adherent to the bladder. The two sacs were of equal length hourglass in shape and about three and one half mehes each in length The hourgins sacculation was due to a thrision of the original sac his a strongly developed Hesselbach

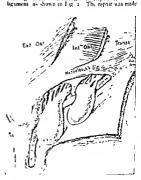


Fig 2 Billocalistion of a hermal sac by a strongly dischard Hessilhach s lightness

the term interparietal hernias

a general description

according to Bassini and the fiscit was imbricated by the Andriws method. The patient mails an uncertaint recovery, the wound healing by primits microtom.

Bret analony of Hesselbach treament. The conjound tendon of the external oblique and transceradis is attached to the crest of the pulms and to the pectineal lim. It is some times divided into an outer (Hesselbachlegament) and an inner portion (Heeles legament). The former is situated on the posterior wall of the inguinal canal analtion of the deep epigastric artery (Eq. 9). A V hermal six may be housed by a strongth developed Hesselbach's hagmant as it emergefrom the inguinal canal, thus producing a blocular six.

The second history is that of a case of double hermal sac in which however Hesselbach's ligament was not the cause of hillandatum.

G. M. Grick liborer. Admitted to the Presbyterian Hospital July 24, 1010. Four years previous to the data of admission, while lifting a very heavy

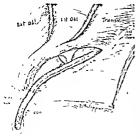


Fig. 3. Showing Hisselbach's ligament



Le 4 Double berneil - n

stone he experienced some paint in the right inguinal regum and soon after discovered a slight swelling in the same region. It remained small for three years but mercased rapidly in the last year general health was good during that period general routine examination revealed nothing path The right inguinal area was represented by a tirge turn faction which discended into the scrotum It had all the physical earmarks of a hernia. The inguinal ring was very large. The entire mass was readily reducible. The left inguinal rigion contained a swelling that increased on cough and was also a hermi. The patient was operated upon by Dr. D D Lewis The herma was exposed by the usual mersion. There was a very large sac of a direct type surrounded by very dense bands of connective tissue. There was another sac of an imilired type in close connection with the first (Lig 4) Both sacs were isolated transfixed and ligated dropping the stumps back. The repair was made according to the Bassini method. Both incisions herifelt by primary intention

CHORIO-EPITHELIOMA '

RECURRENCE AFTER THREE YEARS, INVASION OF THE SPINAL CANAL; VILLE IN SECONDARY GROWTH

BY EUGENE CARY, S B, M D, CRICAGO From the Pathological Laboratory of Rush Medical College

THIS report is not intended to merely add another to the rapidly growing literature on the subject, but rather to try and emphasize the exceptional features in the case Over 300 cases have been reported, and so far as I have been about the summaries made, some of the conditions I have studied have not been described

Clinical history - Mrs M M 37 years old miscarned early in February of 1007 and for the follow ing four to six weeks suffered general debility and had three or four severe utenne hæmorrhages, for which she was curetted twice, unfortunately the scrapings were not examined microscopically month later a brownish discharge developed that stopped of its own accord A little later she caught cold" and had pains all over the abdomen which finally located in the uterus, the week follow ing a palpable tumor developed in the left side and an operation was advised She entered the Presby terian Hospital in the service of Dr J Clarence Webster on June 12 1907 complaining of pain in the lower abdomen and pelvis, tenderness in the left lower quadrant, and intermutent uterine hamorrhages for the past four months following an This miscarriage took place about six abortion weeks after gestation began. She stated that after two days of pain the foctus came away but that the placenta remained

Her menstruation was established at eleven years which was of the regular 28-day type, with moderate flow lasting three to four days, without pain. The last period was in December. She was marrised to 32 and had been pregnant five times. All the other pregnancies went to term. The first child was defined with the control of the contro

She never nursed her children

The operation was a panhysterectomy

Condition of the abdomer and police contents on a cutton. The uterus is considerably enlarged being 12 cm in idepth. There is a mass 5 cm in identified the left side extending into the broad figament and consisting of a mass of hidatid like size. There is extensive vascularity and the keeping of the broad ligament on the left side. All parts are and bleed, toom its surface. The growth extends hate the thickened left ovarian veins and the latter were removed as high up as possible. The owares are shrunken and firm, the tubes short, being 7 cm

The recovery was uneventful, and the patient was discharged from the hospital in good condition.

The admission the second time was to Dr. James B Hernck's service in the same hospital on June 25, 1910, three years following the previous admission. She was then complaining of backache, ach ing in the hips and abdomen, and chronic constipa-

The previous February she had an attack of the "grippe," when the pain began in the right hip spread to the back and other hip, and radiated down into the groin. This was intensified on moving about and has been constant ever since She also had pneumonia during the preceding autumn From entrance, June 25, to July 3 the patient complained bitterly of the pain in the back and legs which was not relieved by opiates. She was very restless and slept but little On July 5th she coughed occasionally raising a small quantity of bright red blood. Next day she had retention of urine Numbness and tingling of the feet without the ability to stand developed, and she became almost helpless, erying aloud with pain On July 9th and toth she complained of pain only when her head was raised and then only in the back. Involuntary defecation appeared and retention of urine persisted On the 1rth she had a feeling of fullness in her chest and her respirations rose to 48 per minute, her temperature per rectum was 102º F also both leg-

were slightly ordematous

She died August 6 1910 of exhaustion

Gross description of the uterus. The uterus is much enlarged about the size of a 4-month pregnancy, and contains a mass, the size of 4 large English walnut (Fig. 1-A) just posterior to the origin of the left broad begament the whole measuring over 12 cm. The cavity (Fig. 1.B) is clean smooth and not distended It contains no polypoid growths. The left wall of the uterus is 3/2 cm. thick, but has no changes other than thickening that can be found macro-copically. The tubes and ovanes appear unaffected (Fig. 1 B and C).

The tumor mass in the left broad ligament contains a good deal of hamorrhage (lig r a) and many translucent vesicles (Fig 1 b)

Read before the Chango Gypecological Society Assember 1912

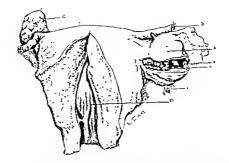


Fig. 1, Uterus and admera. (A) Fumor mass in broad legiment. To which is adhierent a piace of omeral fall. The tumor is plot lopen showing. (a) hymorrhage in its depths, (b) imany dilated translacerat vessles, (c) a few pendulous opaque venicle. (b) The tube is end just above the tumor mass spacerath normal except for a slight shortening. (c) O sare which is ferm and somewhat around the procurent measure over 13 cm; in the transcepter disminister. The victories will be 32 on in this knew.

also a few opaque ones (Fig 1 e) On the right side of the uterus postenorly where the wall merges into the broad ligament is anoth or group of these vesseles with however not much if any hemorrhagic reaction around the area. These areas are definitely circum scribed and probably metastatic and they have no connection with the cavity of the

The left ovarian vein (Fig. 2) is composed of a tumor 5 cm in length. On cut section the lumen of the vein for the most part is dilated and oxcluded by either the dilated vesicles (Fig. 2 a) or by a growth that very much resembles a cauliflower (Fig. 2 c). There is some harmorrhage, but thus is not marked (Fig. 2 b).

The post mortem evamination was held three and one half hours after death

Anatomical diagnosis Absence of uterus and adnexa, metastatic nodules of secondary chorio-epithelioma in the lungs, spleen, diaphragm dura mater spinal cord, pulmonary arteries ovarian and iliac vessels, and thoracic duct, anamia, fatty changes in the hver, passive hyperterma of the kidneys, bilateral inbrous plurisy, a staphylococcus and colon bacillus in the body cavities and blood

Condensed post mortem report The left lung is attached to the pleura by scattered bands of adhesions The lower lobe is adherent to the diaphragm on its anterior border The right lung is attached to the poste rior chest wall along the vertebral margin by a few bands of fibrous tissue. The lungs crepitate on pressure and contain nodular areas On cut surface there are many nod ules, varying from very small ones to ones 2 cm in diameter, being especially large at the point of entrance of the pulmonary vessels Beneath the pleura are many similar areas. wedge-shaped with their bases at the pleura One of the pulmonary vessels is filled with the tumor mass, and many of the smaller vessels are filled with similar solid white plugs. The spleen shows two infarcted areas on its



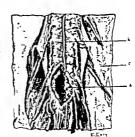
Fig. 3. Section through the margan constrained for the many hyperconduction. The mass is improved of defended ovarian cents containing fumor mass adjacent lessor mounting failt issue. The drawing pitestell the sure mounting failt issue. The drawing pitestell this touch only one of the marganite failt issue. The drawing pitestell this touch only one of the marganite failth of the marganit

surface. The right ovarian vein is greatly enlarged, with irregular sacculated dilatations and is partly tilled with a solid appearing white mass. The left external iliac vein has attached to its inner surface a similar white mass about the size of a pea. The left external iliac artery is filled with a similar mass There is a tumor mass just above the pillarof the left leaf of the diaphragm as large as an English walnut It is opposite the body of the twelfth thoracic vertebra Another slight ly larger tumor mass is present just under the pillar of the diaphragm on the right side There are no gross changes in the vertebrae In the lower thoracic part of the thoracic duct there is a mass 5 cm long occluding the lumen This mass is irregular in shape and white in color containing some blood-stained areas On the vertebral side of the cord there is a cavity about 1 cm in diameter (Fig. 3. a). and this lies in the region of the cauda equina

Its walls are fined with necrotic tissue, which is granular and hangs in shreds

Microscopical The tumor tissue is nearly all limited to the blood sinuses in the region of the tumor of the broad ligaments These spaces contain villi which are large and somewhat distended, no blood-vessels, of course, are found in them These ville all contain on their margin a distinct layer of Langhans' cells outside of which is a border of syncyturm In some areas there is an active probleration of both cell types but the increase is mostly in the Langhans' cells Whole islands of Langhans' cells are found at the margins of the elongated villi, in which are evidences of rapid cell division and a few mitotic figures In a few areas syncytial or wandering cells infiltrate the uterine wall chicily between the muscle hbree In this region is also some round-cell inhitration and an invasion of leucocytes. Very little necrosis and hæmorrhage have occurred There is little vacuoli zation of the sancytium and the cell- are apparently strong and healthy

The tumor in the ovarian vein removed at the time of the hysterectomy also contains



Itg 3 (axity in the vertebral side of the spinal cord. This cavity is in the cauda equina. Its walls consist of necrotic tissue which is very frable. The lumen is about icm in diameter [4] (avity, (6) arters [c] meninges of the cord opened out

villous growths, but the arrangement between the syncy tium and Langhans' cells is not so regular or typical. In some extensive areas the epithelial covering of the villus is entirely absent. The relation of the two cell layers, however, is still maintained. In this region harmorrhage is a prominent feature and the corrosive action of the tumor is manifest, for in these blood spaces, which are filled with fresh blood, fibrin and cell detritus line the villi. Polyhedral cells are also present with some proliferating syncy time.

The metastatic tumors in other parts of the body contain, for the most part, a central mass of disintegrated blood and debris, surrounded by a row of cells that are for the most part of Langhans Hæmorrhage is prominent about this central area, and the cells invading the surrounding tissue seem to work in between the normal tissue cells where pressure atrophy occurs In free blood channels, in a few instances, he masses attached to the adjacent tissues, consisting of Langhans' cells surrounded by a thin layer of syncytium one blood-vessel in the tissue removed from the prevertebral region is a villus whose central part is necrotic but which is still surround ed by epithelium composed of an incomplete row of Langhans' cells outside of which hes syncytium At one end of the villus are two or three syncytial giant cells and an area of actively proliferating Langhans' cells with one or more mitotic figures present.

As Schmauch states in his paper, it is difficult to ascertain the true character of the growth from some of the descriptions, because cells defined as syncytial cells by one author are defined by another as Langhans' This latter name should in all cases be restricted to the sharply defined cells with lightly staining protoplasm, distinct nucleoli, and a chromatin network, and surrounded by "The true chorio-epithelioma is syncytium a well-defined structure resembling the epithelial covering of a villus in the early stages of gestation and placentation, namely Langhans' cells permeated and surrounded with syncytium, and plasmodial masses re sembling the syncytial ends of villi " Through the works of Fleischmann we have come to know of a chorisma that is made up of cellwholly syncytial, which are for the most part mononuclear or may contain two or even three nuclei; the protoplasm is typical This type of chorio-epithelioma Schmauch should be designated as "atypical." This one-celled type, a syncytial cell, which looks somewhat like a decidual cell, represents one of the three types of trophoblastic cell, and this type is not able to assume the other two forms "It is probable that the atypical chorio epithelioma is only a later stage of the other forms, in a similar way as the syncytial cell is a later stage of the trophoblast and its derivatives, the Langhans' cell and syncytium (Schmauch)

A brief consideration of the classification of these tumors, as represented by the works of Marchand, Ewing, and others will perhaps make the subject more clear The "typical" chorio-epithelioma, according to Marchand's classification, is composed of multinuclear, cosmonhile, syncytial masses and a smaller number of mononuclear, polyhedral, lightly staining Langhans cells, which may or may not be in villus arrangement. It is the mildest type of tumor originating from the feetal ectoderm and possesses fairly constant characteristics Ewing has termed this "chorioadenoma destruens" or "malignant placental polyp" When vallus formation prevails they invade a large area cause the uterus to become enlarged uniformly, and may project into the cavity as a polypoid mass. The growth extends to the broad ligaments, but tends to remain confined to the uterus. The cells have only a limited ability for growth outside of the structures of the villus. It is the exception to find villi in the metastatic Only branching ends of the vacuolated syncytium and sharply defined Langhans' cells without much morphological deviation from the normal are most characteristic.

As early as 1886, H Klatz noted this condition in three cases of destructive placental polyp and termed it "adenoma of the placenta."

The "choriocarcinoma" of Ewing corresponds to the malignant chorio-epithelioma of Marchand. This growth is recognized by the absence of villi and the extensive prolifera-

tion and metaplasia of the Langhans' cells and of syncytium The tumor cell possesses remarkable capacity for independent growth away from the villiand a loss of cell differentiation in the secondary growths The primary tumors in the uterus are comparatively small - in some instances reported as absent, or so small as not to be found, and the organ but slightly enlarged, while numerous metastases are found in the other organs of the body. In the "atypical" chorio-epithelioma, actively proliferating Lunghans' cells and syncytium are missing. The uterme musculature is infiltrated with large acidiphile, mononuclear cells which, it is asserted, arise from the ectodermal cells of the fortu-These are sometimes called syncytial wandering cells, on account of their re-emblance to and association with masses of syncytium. There are large variations in this form, and Marchand emphasizes the infiltration of the musculature ol the uterus Lwing has termed this process "syncytial endometritis"

Meyers states, and I think that we all know that an invasion of the uterine mu-culature with these cells is lound in the early months of pregnancy and continues to the sixth month, but may and should be entirely missing at full term. These syncytial wandering cells resemble decidual cells very much, but they can be differentiated by the fact that the extendasm of the former is more opaque and acldophile, and the nucleus larger and richer These cells form considerable in chromatin masses, are usually largely necrotic, and mixed with blood clots and fibrin Large, circumscribed well nourished tumors made up of such wandering syncytial cells with metastases of similar structure have been observed (Lwing)

In certain growth there is more or less absence of Langhans' clk and increase of the syncytimu or wandering cells or both, called by Kuing "transitional syncytial chonoma or sucytimus". He considers these retrograde forms of the more malignant types in which the cell vitality has become depleted. In short, these tumors stand between the choricoarcinoma and the chorico-adronoma on the one hand and the syncytial endometriis or attypical choric spelinding on the other.

As regards malignancy and non-malignancy of chorio-epithelioma. Schmauch has made some very interesting deductions in conjunction with the work of several others. He says, "The presence of plasmodium when not connected with a villus must always be regarded with a villus must always be regarded as a sign of malignancy." Also "The assemblage of well defined cells of the character of those forming the Langhans' layer, no matter what size or form, amongst healthy tissue or true plasmodium is, when found sectoral months alter expulsion of the ovum, an unmistabable sign of boundless growth.

The atypical choric-pithelioma or transitional type is, I believe, conceded by most authors to be less likely to terminate latally, and spontaneous recovery to occur in a great many cases, also the metastases are more infrequent and may retrogress. Why is this

true, or is it true? It is shown that the Lanchans' cell is the most vitalized cell of ectodernial origin and is always the eluci proliferating part of a malignant chorio epithelioma Its action is most corrosive upon maternal though, therefore it is only reasonable to assume that with the predominance of these cells the im asion of the maternal host would be most rapid . According to Schmauch and Velitz, spontaneous recovery is brought about by necrobio-1-, which is manifested by the diminished vitality of the Langhams' cells, absence or scarcity of mitosis, and the appearance of numerous wandering cells The true arrangement of syncytium and Langhans' cells is lost, and atypical Langhans' cells, syncytium and wandering celfs make their appearance, which latter are believed to be degenerative and necrobiotic forms of the original chorno-ectodermal structures

Briefly, it is believed that the transitional and atypical forms of choric epithclioma are tumors that have undergone retrograde changes. The vitality and virulence of the cells is diminished, and the growths present only degenerative forms, which as in thistory of all such conditions, are spassmoffic attempts on the part of the cells to reproduce their kind, and on account of their lessened vitality are merely abortite forms of the original condition.

the reported recoveries after operation following this type of tumor, the latter forms of chorio-epithelioma are considered less malignant than the typical forms. Still, from the viewpoint our case gives us it would tend to show that, although a choriocarcinoma may be malignant and a chorio-adenoma usually benign or much less malignant, the pieture may change and a tumor which at first appears benign may later become malignant fore, if an apparently benign case may later become malignant why is it not reasonable to assume that an apparently malignant case may retrogress and become benign, especially inasmuch as the more benign cases are con ceded to be retrogressive forms of the once typical chono-epithelioma? In short, while the different histological pictures may be some guide as to the prognosis, they cannot by any means be regarded as conclusive

Some difficulty is encountered in attempting to place this tumor in the proposed classification, because, while the examination of the uterus alone would beyond all doubt place it as a chorio adenoma, the further course of the conditions would tend rather to disqualify this statement. Without doubt it was primarily a chorio-adenoma, both from the microscopical picture and from the clinical history. The exceptional features were that the uterine cavity remained apparently clean after curettage and that the extension was considerably more than is usually found in this conditions.

Solowij and Kryzskowski reported a ease in 1900 in which a whole villus was found in the In our case several villi were found outside of the uterus - a rare condition These were seen in the broad ligament, the ovarian veins, and three years after the hysterectomy in a vessel in the prevertebral region, and one or two attempts at villus formation in the pillars of the diaphragm The presence of these villi would lead one to believe it to be more or less benign; but the fact that an overwhelming secondary growth recurred practically all over the body, in conjunction with an active proliferation and metaplasia of the Langhans' cells and the presence of mitosis, would speak for an active malignant tendency.

Teacher, in 1903, collected a series of 188

cases, in which radical operation was performed 99 times, with 633 per cent of recoveries. In all of these cases recurrence was noted within six months or not at all, with the exception of five cases, the latest of which recurred at the end of one year

In this connection it is interesting to note that the choriomata following full-term deliveries show after operation a higher percentage of mortality from recurrence that those occurring after either abortion or lydatid mole. He states the percentage of recoveries to be 20 4 after labor at term; 46 6 per cent after hydatid mole and 33 per cent after abortion.

Other observers have reported cases in which the secondary manifestations were delayed over varying lapses of time, but very few have reported cases where hysterectoms had been done previous to these manifestations and following the condition that was the causal factor For this reason our case would stand as exceptional, because the secondary manifestations occurred late after hysterectomy, when if they were to occur at all, it would seem reasonable from past experience that they occur early Localiein reported a case in which recurrence was delayed for a year Dukeman last year reported a case in which the main symptoms were bleeding at irregular intervals and passage from time to time of masses of tissue. with gradual loss of weight and strength. This was preceded by an abortion, and three years later hysterectomy revealed the presence of chono-epithelioma, in all probability a malignant placental polyp, as villi were found in the uterus M Caturam also reported a case last year in which a tumor developed in a woman 51 years of age, five years after the passage of a hydatid mole; but hysterectomy had not been previously performed Bland in 1902 speaks of a case developing a chorioma six years after a fullterm delivery, and in 1900 Kaufman reported a similar case showing symptoms two years

In reviewing these cases with long intervals between the labor or abortion and the manifestations of the tumor, one will immediately be struck with the idea of whether or not the woman had not become pregnant again. In fact some of the authors place a question mark after the statement that no pregnancy has occurred during the intervening period This is perhaps more forcibly borne out by the table Ladinsky published in 1902, in which he states that the average time when the primary manifestations occur following the different conditions was, for labor at term, five weeks, for abortion, seven weeks, after expulsion of hydatid mole, eight weeks

It was noted that in our case the clinical symptoms appeared relatively early, and at first they followed out the general behavior of the average case of chorioma interesting, too, to note that after hysterectomy the case made an uneventful recovery. for if metastases are going to occur, operation only hastens the fatal termination. It is difficult to decide why the growth should remain dormant and then flare up with such rapidity. At best only conjectures can be made on this point Was the resistance of the maternal tissues enough to inhibit the corro sive action of the choronic cells until the at tack of pneumonia lowered the bodily resistance and allowed of an invasion and unrestricted growth of the foreign cells, or was the pneumonia a premonitory manifestation of the growth of the cells in the lungs? This cannot be answered, as we do not understand well enough why a cell at one time can easily destroy tissue and at another exert very little if any destructive action toward these same tissues It is enough to call attention to the fact that there was a complete subsidence of the growth for nearly three years after radical removal of the uterus and adnexa From this slightly different viewpoint, it may bring to light cases that were reported as having completely recovered dying years later from general metastases, when death was attributed to some natural cause

Brain metastases are not uncommon and may be found mentioned in a number of cases Inglis and Bruce, in 1909, reported a case that died of brain harmorrhage six months after repulsion of a hydatid mole with brain metastases Dunger also reported a similar condition, in which the patient died three years after a moler pregnancy. In our case paraplegia developed, and although the lesion showed no definite living tumor cells the condition was undoubtedly due directly or indi rectly to a metastatic focus, and is the only lesion of the cord that has been reported, as far as I have been able to find in a review of the literature.

In conclusion, one would be justified in calling this case a chorio-adenoma with malignant tendencies. It represents what Ewing terms "potential malignancy," for both the clinical and histological picture is that of a rather benign chorioma. This benignity last-ed for nearly three years, when the malignancy of the condition appeared, as shown by the fatal termination from general metastases; which metastases; which metastases; in contrast to the earlier tumor growths, gave a smister picture, containing many, Langhans" cells with mitotic figures, necrosis, thrombosis, and a leucocytic reaction. These latter Meyers considers the

essentials of malignancy

The three most exceptional features in the
case are, first, the presence of villi in the
secondary tumor growths, secondly the long
lapse of time after operation before fatal
termination of the condition from metastatic
growths, and lastly, the peculiar jesion in the
cord that gave such interesting clinical manlestations of paraplegia. The first two conditions have been noted in the literature, but
as far as I have been able to ascertain the
lesson in the cord is unique.

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INDICATIONS FOR AND RESULTS OF OPERATIVE TREATMENT OF OTITIC MENINGITIS

BY EWING W. DIY, M D, PITTSBURGE

NTIL 1893, when Macewen pub lished a report of six recoveries out of twelve operative cases, no serious attempt had been made to treat suppurative otitic meningitis surgically The prognosis had been so uniformly un favorable when either medical or surgical methods were used that the outlook then for obtaining a curative procedure for this most dreaded of aural complications wamost discouraging Since Macewen's report however, interest in both the medical and surgical treatment of meningitis has been Improved laboratory methods and the introduction of lumbar puncture have made more accurate diagnoses possible Old methods of treatment have been revised under more favorable conditions, new onehave been enthusiastically advocated sults, while indicating that modern therapy has entered only the border line of the disease. have been sufficiently encouraging to justify at this time more persistent and painstaking research than ever before

It is true, however, that unfavorable results, of which there must be a vast number, do not appear in the literature, so that while we should not underestimate the progress that has been made toward successful therapy we should not minimize the fact that at the present time supparative meningitis has the highest mortality of all aural complications. In view of this it does seem that, with everything to gain and nothing to lose, we are justified in trying any treatment, medical or surgical, which suggests the slightest hope of relief

It is our purpose in this paper to carry out the suggestion of your programme committee and give you our results as they have occurred—our mistakes, failures, and apparent successes, in a plain, unvarnished summary.

The writer has treated 57 cases of meningitis since 1897, 53 were of otitic origin,

2 of nasal, and 2 secondary to pneumonia. These were all diagnosed as diffuse suppruntive meningitis, and the diagnosis was contribed in 38 cases by autopsy. Four cases and one with the aid of vaccine therapy. One of the 3 cases, however, died three months later from a reinfecting meningitis. These cases will be referred to late.

Meningitis followed chronie purulent otitis and its acute exacerbation twice as frequently as the acute purulent otitis That complicating acute office was more often of an explosive type, running a rapidly fatal course. That following chronic purulent otitis was less hable to be explosive in type. having a more protracted course. In addition, with chronic otitis an apparent prodromal stage could often be discovered, extending from a few days to as long as 115 days, in one case before the meningitis was clearly defined The symptoms were generally slight recurring headaches and malaise, usually assigned by the patient to a disordered stomach or "biliousness." This history, elicited too often to be merely accidental, indicates without doubt in some cases a latent or slowly progressive stage of the meningeal infection. If such a stage custs following acute otitis, it is so masked by the acute condition of the ear that at present we are utterly unable to define it The work undertaken by Kopetsky, when put on a practical working basis, will be especially valuable in detecting these latent invasions

Seven of our cases were complicated by sinus thrombosis, 8 by brain abscess, and to by purulent labyrinthitis. In only 3, however, was a diagnosis of labyrinthitis made before autopsy. Many more probably would have been found if proper means of diagnosis had been employed, but the writer's knowledge of labyrinthine involvement and

Read before the Third Chincal Coopers of Surgeons of North America, New York, November 14, 1013.

its significance prior to the published works of Barany and Neumann was too hazy to be of value

The treatment of our cases varied. The mastoid operation, either simple or radical, was parformed in 48 cases. In 15 no other surgical means were employed, in 33 cases the mastoid operation was supplemented by other procedure directed to the infected to the respective of the continuous sin to cases by dural drains; in 8 by simple incision of the dura for drainage, in 4 by autogenous vaccines, in 3 by drainages of the custerna magna, in one by drainage of the literal ventriele, in one by lavage of the eventriele, in 4 by intraspanal injection of ourotropus solution, in 2 by intraspanal injection of olivogrande of mercury.

It is impossible to establish definitely the indications for operation All, however, agree that it must be done early, practically before the meningitis has developed means that the operation, to accomplish its purince is not one for the cure of a diffuse meningitis, but one to prevent suspected localized meningitis from becoming diffuse What then, are the indications of a begin ning or threatened invasion of the meninges? Have we any diagnostic means at our command that will aid us at this early stage? If there are any of precision they are unknown to the writer for the indefinite history of malaise already referred to is too vague to be of creat value. However of the early symptoms of meningitis, the two mentioned by Haynes, steady increase in blood pressure and extens of the papilla, are a distinct help Unfortunately they were not accurately noted in our histories In two cases a slight ordema of the desc was recorded More often the eye grounds were reported as normal upon early diagnosis that successful therapy in the future will greatly depend

Of disprostic methods, lumbar puncture at the present time gives us the most reliable information as to the condition of the meninges. The presence of pus cells or progenic organisms in the fluid is usually considered deagnostic of suppurative meningitis. Slight utribidity cannot be accepted as a positive sign of a diffuse process, for it may result from a very limited area of infection.

serous meningitis, a slight turbidity may be present with no pathogenic organism. Decided turbidity, on the other hand, with a markedly increased number of polynuclear leucocytes in the presence of progenic organisms, indicates an extensive involvement and a correspondingly hopeles condition

Some otologists attach nuch less salue to lumbar puncture than we do. Thus Aler ander states that "the result of lumbar puncture gives a clear idea of the menings, the result cannot, however, he said to have any bearing upon or he a contraindication to operation. The absolutely hopeless proguested of the puncture of symptoms, never by the result of lumbar puncture."

Keevner, referring to the diagnostic value of lumbar puncture, says that "from an extra or intradural abscess, a brain abscess, a sinus thrombosis, or a labyrinthine sup puration, cerebro-pinal fluid may be flooded with leucocytes, bacteria, and torins, and thus cause or lead to a fully developed meniagitts symptom complex, without the presence of any cloudiness or suppuration in the soft brain coverings " This condition he designates as the "largufe" or premonitor, stage of a purulent meningitis words the undings from examination of the spinal fluid might under certain conditions lead to a diagnosis of a more serious condition than really existed In none of our fatal case in which the spinal fluid was examined did we find that this occurred instances the examination of the spinal fluid led to underestimation of the gravity of the brain condition In these, repeated puncture, showed a slightly clouded fluid, nonpathogenic bacteria, and lencocytes but no infective organisms. On post-mortem examination, however, streptococci were obtained in abundance, both by smears and culture from the dural spaces.

Holger, in discussing the operative treatment of suppurative meningits, states that in cases of localized inflammation of the meninges he never found any alteration in the spinal fluid.

Despite the findings of these men, in our opinion examination of the spinal fluid is the

most important means of diagnosis. Unfortunately, as now employed by the most of us it seldom gives warning of a threatened invasion, but of one under way

The bacteriology of the primary aural infection offers no indication for or against operative interference. For it does not always follow that the organism found in the ear at time of examination will be identical with that in the dura. This is especially true in chronic purulent ottlis media. In one case, staphylococci and non-pathogenic bacteria were obtained from the ear, but the streptococcus capsulatus mucosus was the meningeal organism. In several others, staphylococci were present in the ear and streptococci pyogenes in the dura. In another, no pathogenic micro-organism could be found to account for a streptococci meningitis

Nor does the nature of the dural infection offer any indication for or against operative measures. The individuality of the organism seems to make but little difference in the course of the disease, either before or after the operation. In our cases, the average duration before death of pneumococid meningitis was nine days, streptococid eleven, and in the two cases of staphylococid ten and eleven days respectively. Those cases with mixed infection were much slower in their termination

Of more importance in influencing the course of the disease is rather the virulence of the infecting organism Our experience coincides with that of MacCuen Smith, in that the pneumococci give rise to a meningitis which in severity is equal to if not greater than that streptococci causes His statement that cases of staphylococci meningitis will most likely recover, however, is contrary to the result in two of our cases, which were of more than average virulence The virulence of the intecting organism is apt to be of a mild grade in those cases where the spinal fluid is either free from bacteria or contains only attenuated forms.

Lastly, the clinical condition of the patient, even il grave, offers no contraindication to operative procedure. In cases of moderate severity the brain symptoms showed improvement, sometimes extending over several

days. In the worst type the condition remained unchanged, and death was in no ways hastened by the operation. On the contrary, we are of the opinion that by drainage and the relief of pressure the average duration of the disease has been perceptibly raised. The average length of suppurative meningitis is given as seven days. The average duration of our cases operated upon was thirteen days. The number, however, is far too small to justify conclusions.

Before proceeding to a consideration of the treatment of otitic meningitis, we should like to emphasize the importance of postmortem examination in the solution of this problem If autopsies accomplish no other purpose, they show us what effect our operative treatment has had on the progress of the disease With this in view, the board of managers of the Eye and Ear Hospital in 1008 passed a rule requiring that all patients admitted to the ear wards, or their legal guardians, give permission for autopsy in the event of death Since the enactment of this regulation, all of our fatal ward cases, without exception, have had post-mortem examination

The treatment of suppurative meningitis by the administration of drugs per oram has been proven so absolutely valueless, except possibly in the use of urotropin as a prophylactic, that no comment is necessary.

There then remain only local antisepsis, vaccine therapy, and surgical procedure, until the
laboratory and research workers come to our
aid with something of greater value. Theoretically, surgery should give relie. Practically, the mortality has not been changed by it.
Theoretically, an operation should be done
early, while still localized. Practically,
we have to take the patients as they come
to us, many of them with a diffuse involvement of the meninges, and do the best we
can.

METHODS OF TREATMENT

The various methods of treatment employed in our cases, either singly or in combination, were:

- (a) Injection of drugs into the spinal canal,
- (b) Vaccines and sera
- (c) Operation,

The operative procedures were:

t Eradication of the primary focus of infection in the ear and adnexa.

z. Exposure of the dura around the ear and drainage from the site of primary in-

3 Drainage of lateral ventricle for relief of pressure.

4 Attempted irrigation through the lateral ventricle to a needle in the lumbar spinal canal

5. Drainage of the cisterna magna

The favorable reports given the writer by Dr McKernon led us to use protropin intraspinally in 4 cases Of these, 4 had streptococci in the spinal fluid, and one pneumococci In only one case, a streptococcie, was even temporary improvement noted Our technique consisted in injecting gradually a sterile solution of 100 gr of urotronin in such concentration as not to exceed in bulk one half the amount of spin,il fluid removed. Three hours after the injection the patient's temperature fell from 101 5° to 102° The next day it returned to 103 so A second insection of protropin was followed by a drop of only one balf a degree Two subsequent injections of the same amount, at intervals of 12 to 21 hours, produced no perceptible change. No ill effects of these large does of the drug on the kidneys or other organs was noted

Of the other 3 prtients, 2 had three in jections and one two injections without change in their condition or alteration in the course of the discase However, the possible benefit from urotropin should not be underestimated because of our non-success, for in Dr. McKernon's hands there have been a number of recoverries

We tried the intraspinal injection of the origanide of mercury in two cases who were in desperate condition, within half an hour of each other, largely because their relatives mere in-stent that this drug should be used. In the first case, a girl of seven with only a few hours to live, one tenth of a grain of the ovicyanide of mercury in one ounce of sterile water was injected. This was quickly followed by intense restlessness and bladder and rectal irritation. Later cardiac failure super-

vened, with pulmonary cedema, and death six hours from the time of injection. Autops, revealed in the posterior part of the temporal lobe a large absess which had ruptured into the lateral ventricle, and acute congestion of the kildneys.

In the second case, where the meningitis developed one week after an operation for thrombosis of the right lateral sinus and internal jugular vein, one fifteenth of a grain of oxicyanide was used. Here similar irtitation symptoms followed, and later cardiae nealness, sesical and rectal paralysis, and acute nephritis. Death ensued nine days after the injection, from a thrombosis of the lateral left sinus. The spinal fluid, which had contained pus and streptococci before the injection, on the day following and subsequently was free from bacteria. Autopsy showed that the meningitis, which had extended over a great part of the right hemisphere, had subsided. Cultures taken were negative. However, any benefit from the drug that may have resulted in the meninger was off-et by the inflammation in bladder

and kidney, acute enough to have caused early death Vaccine and serum therapy in suppurative meningitis seemed to us to offer great possibilities, and after our first trial, which, as so often happens, was our most successful one, was enthusiastically advocated. The patient a girl of 19, was operated on December 6, 1908, for simple mastoiditis Filteen days later there was evidence of diffuse suppurative meningitis, with streptococci and pus in the spinal fluid At the end of 48 hours to ce of antistreptococcic serum was injected intraspinally, and 12 hours later, one hundred million dead streptococci in autogenous vaccine subcutaneously. These injections were repeated in the next 48 hours. On the fifth day after onset the maximal daily temperature had dropped a degree, from 103° to 102°, and the spinal fluid was clearer. From this time on there was steady improvement in the patient's condition, the temperature reaching normal on the eighth day. Several more subcutaneous vaccine injections were given during convalescence. The patient has been seen at intervals since leaving the

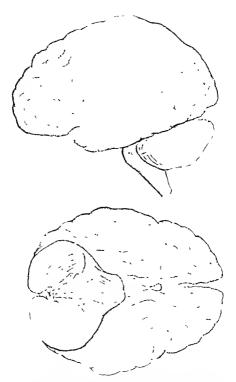
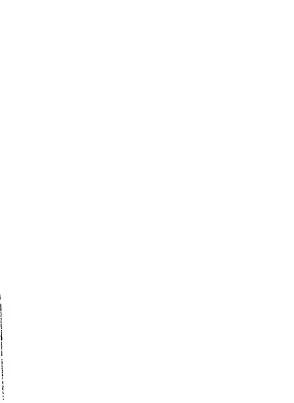


Plate I Extent of effective subdural dramage in temporal and cerebellar regions Death and autopsy two years after dramage for influence memoralis. (Illustrating article on "Indications for and Results of Operative Treatment of Otitic Meningitis," by Fuing W Day }



haspital, and to-day is in normal health The second case in which vaccines were used improved markedly for three days, and was expected to recover, but then became gradually worse, and died on the fourteenth day. The two remaining cases showed no reaction to vaccines. In a number of others they were tried in conjunction with dural drainage, but without noticeable benefit We have, therefore, come to doubt the utility of vaccine therapy in suppurative meningitis, and have discontinued its use, though with great reluctance.

The aim of operative procedure in otitic meningitis is twofold, first, prophylaxis, and second, radical cure. A prophylactic operation eradicates the primary focus in the ear and adjacent bony cavities. As a measure to prevent the spread of infection to the meninges this is of utmost importance; as a curative one, when meningitis has actually developed, it is of little value, for it will not arrest the advance of the inflammation, and should be considered, therefore, only as a minor part of operative procedure. Removal of the primary focus was a preliminary step, as already stated, in 48 of our cases, regardless of after procedure In no case could we see that this alone had any influence on the course of the meningitis In one case, we feel positive that by a radical mastoid operation a latent or circumscribed meningitis was converted into a rapidly fatal one. Whether the dura should be exposed at the primary mastoid operation must be decided by the operator from the clinical data. With no signs of infection beyond the temporal bone, no useless exposure of the dura to possible infection should be considered.

In 18 of our cases, the surgical procedure directed against the complicating suppurative meningitis attempted first to drain the original area of meningeal infection; secondly, to relieve pressure. Haynes, Cushing, and other writers now place greater importance on the relief of pressure than we did when treating these cases. To render the middle and posterior fossar freely accessible, and to insure adequate drainage, the masted to insure adequate drainage, the masted opening is extended into a craniplomy, up-

ward, forward and backward until the following sections of the dura are exposed:

I. That portion above the tympanic cavity

and roof of the mastoid antrum.

That portion over the sigmoid sinus and the cerebellum posterior to it.

3. That covering the anterior surface of

3. That covering the anterior part of the petrosal pyramid If necessary, the Neumann operation on the labyrinth is done. The error is more often made of having the cranial opening too small than too large; it must be ample enough to allow all further procedure with a minimum of manipulation.

In our technique, as a rule three incisions, about 1 cm in length, are made through the dura above the tentorium and middle ear, and two along the anterior surface of the cerebellum Incision of the dura posterior to the sinus is no longer employed, as those on the anterior surface seem to drain that lobe of the cerebellum as thoroughly as when incisions posterior to the sinus were used. An olive tipped probe is then inserted between the dura and brain tissue and gently swept in segments of a circle for a variable distance, breaking up the arachnoid meshes, and drains are introduced. These drains are made of two strands of fine catgut, twisted and doubled back, so that there are four strands with loops at the end to be inserted under the dura Wrapping them in rubber tissues or Cargile membrane facilitates their entrance On account of the distention of the spaces from the cerebral fluid, this is not usually difficult When, however, the brain tissue is under great tension, insertion may be impossible, and the use of drains should not be attempted The drainage of cerebral fluid from this procedure is generally copious enough to moisten the dressing and require its changing two or three times in 24 hours, The drains are of maximal efficiency early, and usually cease to be of use after 36 hours, nor will the insertion of new drains restore the flow.

Up to the present time we have apparently had greater improvement in our cases as a result of this method of treatment than of any other. The benefit was decided, even to the point that recovery was pre-

dicted in those cases where the dura showed distinct inflammatory changes in the exposed area. The improvement varied in duration, from two to three days to as long as three months in one case.

The three cases of dural drainage which recovered were all complicated by brain absers secondary to chronic purulent ofitis in one, cerebellar; in the other two. temporo sphenoidal, the meningitis beginning shortly after the operation for the abscess in each case. In the cerebellar case an abseess occupying almost the entire left lobe, leaving only an outer shell, was evacuated. Pus from the abscess showed a mixed infection of streptococci and nonpyogenic bacteria. Seven days later there were symptoms of meningitis ond operation revealed a large distended lateral ventricle, which was drained, and dural infection in the vicinity of the pyramid. This bone was partially removed, the labyrinth opened, and the dural drains inserted. Convale-conce progressed slowly to apparent though the cerebellar abicess cavity never completely healed. One hundred and lifteen days after the operation for dural deainage, meningetis occurred and death came in four days Unfortunately no past morten examination was held

In the other two cases, those with temporasphenoidal abscess in three and four days respectively after evacuation of the abscess symptoms of meningitis deseloped with turble minal third containing, in one the influenza bacillus, in the other streptococcus. Dural drains were used as described, but their introduction was difficult because of pressure from the protruding brain Both patients had an uneventful convale-cence and were discharged after several weeks The case which had the influenzal infection was seen at intervals for a year and remained well. The streptococcic case was readmitted to the hospital two years later with a recurrence of abscess in the old cavity, and died from a runture of an undrained pocket into the lateral ventricle

One half hour after death the practicability of washing out the arachnoid spaces through a cannula introduced into the

posterior horn of the lateral ventricle, with an exit given by a second needle in the lumbar region, was put to test. A solution of methylene blue was used, at an elevation of one foot. In five minutes the blue solution appeared in fast drops from the lum bar cannula, and was allowed to flow for several minutes; then an autopsy was done. The blue was found to penetrate the subdural arachnoid spaces over the temporo-sphenoidal region partially those in the parietal region near the longitudinal sinus and less markedly, but noticeably those over the frontal lobes The sheaths of the optic nerves were deeply stained. Over the cerebellum, the medulla and cord, the stain was a deep blue Standing out clearly in this blue field was an elliptical area approximately four inches in its long diameter by two inches in the short, situated on the outer and under surface of the temporal lobe and cerebellar lobe of the left side into which no staining fluid had penetrated. Here the membrane, were cemented together and the arachnoid spaces destroyed The clear space corresponded to the center ol the area in which dural drains had been used two years previously. In seven other autornes of cases in which dural drains had been used this clear area was noted, while beyond this region thick nurulent exudate

mas abundant. We have come to believe that this elliptical eleat area represents the limit of usefulness of dural drains in the region of the betrous bone. That they do not drain satisfactorily the central lobe of the cerebellum or lesen the inflammatory action over the base of the brain or spinal cord seems certain We have also concluded that the drainage of cerebral fluid which occurs at first, and generally ceases in from 24 to 36 hours, does not stop from plugging around the bony opening, but because the brain pressure destroys the spaces no longer distended by the fluid and permanently seals them off from the remaining arachnoid.

It is claimed by some writers that several incisions alone in the dura give results equal to those where dural drains are used. Our post-mortems have shown that the elliptical area, if present, is not nearly so clear and

extensive when incisions only are used, so that now we never stop there if it is possible to insert the catgut drains.

In the light of our findings, then, the three cases of recovery which have just been referred to, which presented all the clinical and laboratory evidence of diffuse meningities, and which we have congratulated ourselves on curing, may after all have been simply cases of localized meningities, limited to this elliptical area.

It was realization of the limitations of dural drainage therapy that led us to other methods. The suggestion of Barr of Edinburgh to irrigate through the lateral ventricle and out through a lumbar cannula was tried in one case, a moribund patient, but our efforts to establish a flow of the methylene blue solution in a period of fifteen minutes were unsuccessful Post-mortem examina tion on the following day showed small ventricles with openings blocked off, nearly free of fluid, and no evidence of the irrigating fluid in the spinal canal or arachnoid The attempt proved nothing except that the procedure did not seem to be harmful to the patient It would undoubtedly have been given further trial but that the treatment of meningitis by draining the cisterna magna, as suggested by Dr Haynes in a paper read in June, 1912, before the American Laryngological, Rhinological and Otological Society, appealed more strongly to the

Since then three cases have been treated in this way

CAST A Slav, admitted to St. Francis Hospitals. In a delirous state No history was obtained. An examination showed every evidence of meningtis. An examination showed every evidence of meningtis, also pretumona of considerable extent. On lumbor puncture a turbid fluid was obtained containing abundant pneumoocci. Regardless of the pneumonia, ethic was administered and the externa magna opened. The cerebral fluid was under mozian opened. The crebral fluid was under the dural opening. The following day through the dural opening of the worse in the pulmonary condition could be noted from the administration of ether But in the next twelve hours the patient gree rapidly worse, defirming the patient green rapidly worse, defirming the day of the d

Case 2 A baby eighteen months old On the day previous to entering the hospital the child had been fretful That night it had repeated convulsions On the next day one ear showed acute otitis media with serum Lumbar puncture gave a clear fluid, under pressure, loaded with pneumococci Twenty-one hours from the time of the first convulsion, and 36 from the first symptoms of fretfulness, the cisterna magna was drained For two days following the operation there was such decided improvement that strong hopes of recovery were entertained, in view of the fact that the operation was performed so soon after the onset. On the third day, however, a change for the worse took place, and death followed in a few hours This patient was a private case, and no nost-mortem was granted

Case 3 A child of eight years with a double purulent otitis media, a result of measles a month before. Convalescence from the measles had not been satisfactory, and she was sent to the Eye and Ear Hospital for a supposed mastorditis Her condition on admission was grave Lumbar puncture showed a turbid fluid, containing streptococci. The cisterna magna was opened and gave free continuous dramage to the end For three days after the operation there was a marked improvement though the child still was very sick. Then followed a slow progressive turn for the worse, with death in seven days. At autopsy little exudate was found over the temporal and occipital lobes of the brain and upper surface of the cerebellum. There was considerable thick exudate over the frontal and nametal lobes. A gelatinous exudate covered the base The lateral ventricles contained a moderate amount of turbid fluid, while the spinal canal was filled with thick purulent fluid Sinuses were all patent Cultures made from the exudate on the brain surface gave a pure growth of streptococcus pyogenes Apparently operative drainage had prevented accumulation of inflammatory exudate in the subdural spaces posteriorly, but appeared to have no effect upon the extensive accumulation of pus in the pia-arachnoid. Thus it would appear from this autopsy that opening of the cisterna magna drains a wider area and one higher up than dural drainage in the temporal tegion

As we review, in this way, our work of the last fiften years and see the results attained, we must come to the conclusion that the successful treatment of ottic meningitis is still to be discovered. Serum and vaccine therapy have been a disappointment. The one recovery mentioned here can be considered only as an exceptional case. Drugs introduced into the spinal canal which are powerful enough to overcome the infection of the meninges are harmful to other organs,

substituting new pathological conditions for the meningitis. Dural drainage is effective but to a limited extent. When used in the circumscribed form of the disease it does and should give good results. The successful cases occasionally reported in literature are probably of this class. Drainage of the cistema magna has not, in a limited experience, come up to expectation, but represents a distinct step in advance toward successful therapy.

Despite the none too encounging results of the past, the curative treatment of othic meningitis is only a matter of time. Just as in aviation, the course will be marked by a long line of failures and many fatalities before success is achieved. Its accomplishment will depend in great part on the patience, perseverance, enthusiasm, and co-operation of laboratory workers and clinicians alike, together with earlier operative procedures than hitherto undertaken.

DISCUSSION OF DR. DAY'S PAPER

By FRED WHITING, M D. NEW YORK CITY

The carefully prepared and exhaustive namer to which it has been our good fortune to listen this evening has thoroughly and dispassionately canvassed the field of symptomatology and treatment of meningitisthe most dreaded of all conditions with which otologists have to contend. In opening the discussion of the paper I find little to criticise, less to dispute, and much to commend Dr. Day is indeed to be congratulated that the conditions of hospital administration in his city are so far in harmony with the spirit of medical and surgical research as not only to permit, but also to encourage, the investigation by autopsy of every case in which surgical procedure has been followed by fatality For by this means, and in no other way, can we hope properly to interpret our experience, to formulate our observation, and to profit by our failures The opportunity of following an unsuccessful case to autopsy enables an operator to speak with authority concerning conditions of which his knowledge, in the absence of postmortem examination, can at best be but hypothetical and unconvincing

Is there a man present here to-night, engaged in active work, who cannot recall at least one case, and probably several, in his practice during the present year (without mentioning the host of similar experiences in years gone by), in which the impossibility of procuring autopsy has left him entirely in the dark concerning the correct interpretation of conditions of the most vital importance a proper opportunity for the study of which at autopsy might have enabled not only him, but his colleagues as well, to avoid a repetition of similar unfortunate experiences, would also have enriched our knowledge of symptomatology, and would have contributed as well to the unraveling of many a perplexing problem? It is not, gentlemen, as has often been said, from our failures that we should profit most, but rather from a proper understanding of the reason for such failures

In dealing with the symptomatology and treatment of an inflammatory disease which involves so highly differentiated an organ as the brain and its coverings, we must be prenared to encounter a complexity of symptoms for the interpretation of the vagaries of which the observations of the most experienced surgeons and neurologists will, in many instances, prove a vain reliance, if not at times even a stumbling-block Many and exhaustive have been the contributions and studies to the subject of the evening's paper, and Dr. Day has, so far as the scope of his paper and the time allotted him permits, weighed and analyzed the various claims to excellence and reliability of those symptoms which occur with sufficient regularity to entitle them to be regarded as classical manifestations of

meningitis. None of these symptoms are new, and but few are the results of recent observation. Their importance as corroborating witnesses or contributory evidence in the syndrome of meningitis has long been recognized and appreciated at its full value. The appearance of many of these symptoms with sufficient distinctness to be clearly and une quivocally demonstrable is in most instances delayed until the disease bas reached a stage which precludes the chances of hopeful sur-The goal for which we are all striving is the discovery of some reliable symptom. either physical or chemical, which shall manifest itself with dependable regularity and at the same time shall appear sufficiently early in the course of the disease to admit of a safe operative procedure for the rehef of pressure, before the more serious evidences of meningitis supervene

The most recent contribution to the study of meningitis which is entitled to receive sober consideration is that of Kopetzky, dealing with the biochemistry of the cerebrospinal fluid in health and disease. This work has been prosecuted with painstaking fidehty and contains much information which must commend it to the conscientious student of meningeal inflammations It is still much too soon to determine the practical value of Kopetzky's work in its chinical significance, and only extended experience will enable us to ratify or refute the somewhat enthusiastic claims he makes for progressive increase in arterial pressure and the absence of the carbo hydrate element from the cerebrospinal fluid with the substitution in its place of nitro genous products, as reliable indications of the necessity for early brain drainage importance of the proposition which he offers cannot well be exaggerated in its bearing upon the possible favorable outcome of operation for meningitis, for should his conclusions prove, upon repeated and impartial trial, well-founded, he will have contributed to our knowledge of symptomatology a discovery of the first importance, and the long-sought early symptom will have been found. But with every desire to be just, and with equal determination to be impartial, the burden of his proof is not yet convincing Clinical

experience must more fully corroborate laboratory research.

Have we, then, any single symptom, physical, chemical or clinical, occurring sufficiently early in the disease to enable us to make a sure diagnosis of meningitis, while there still remains time to anticipate or forestall by operation the effects of pressure and toxemia? I have critically perused the literature of meningitis and have listened to the paper of the evening with a mind free from bias and open to conviction, but the closing of the chapter leaves me still unconvinced. Such surecal procedures as have received

the sanction of the medical profession have been given an impartial and intelligent trial in the cases related by Dr Day, and the results of his efforts are fairly well in keeping with the experience of most operators in dealing with suppurative meningitis IIis conclusion, in common with other careful observers of this disease, leads to the conviction that reported cases of recovery from purulent meningitis represent instances of circumscribed rather than diffuse or general meningeal inflammation, and an interesting corroboration of this view is furnished by the recovered case which a year later died and came to autopsy from a reinfection The post-mortem finding which Dr Day reports, of the obliterated subdural space and the welldefined area of soldered meninges, was most illuminating and convincing, and corroborates the views that I have always beld, namely, that our cases of general suppurative meningitis all die Whether these unfortunate results are due to our hesitation in operating sufficiently early, or are more properly chargeable to a general inadequacy in the surgical methods employed, or are to be accounted for by the fact that in our keen pursuit of a surgical solution of all the difficulties with which we are contending we have neglected properly to appreciate the necessity of combining measures for the relief of brain pressure with equally important steps for the arrest of the associated sepsis, may provide material for fruitful discussion. However it may be, we are forced to the humiliating acknowledgment that all measures which have up to the present time been instituted

have proved inadequate and most disappointing

A recapitulation of the various remedies and procedures which have from time to time been heralded as possessing curative properties or promising surjical relief would comprise a formudable and unnetreesting array, and after each in turn would be insertible the applorism. "Tried and lound wanting"

Time does not admit of prolonging this discussion sufficiently to enumerate at length the procedures resorted to or the remedies employed in the endeavor to cure meningitis, and indeed any such summary serves only to emphasize the fullibility of our sudgment in dealing with this distressing disease. We may briefly mention, as measures which have received the endorsement of the profession but have failed to produce the results expected ventricular puncture, lumbar punc ture, lumbar nuncture in combination with craniotomy for through trugation, lamines tomy, and serum therapy Of the last we need only say that it has accomplished splendid results in cerebrospinal meningitis due to diplococcus intracellularis, but its uselulness is limited to this variety of infection for it is effective in no other type of meningitis Of the other measures enumerated, lumbar nuncture has proved the most serviceable for it is an invaluable aid to diagnosis and may even be curative in serous menincitis, but in purulent inflammation of the meninges it offers no rational appeal to our judgment, and as a theraxeutic measure is discredited The internal administration of protropin or other drugs has not in my experience proved at all satisfactory while the intraspinal in troduction of remedies has been either entire ly useless or productive of harmful results

Do we, then, possess at this time any single procedure which, in view of our present experience, may merit unqualified approval? Reluctantly we acknowledge that we know of none. Apparently such relief is still a provision of the future. It would appear that a likely solution of the difficulty may be lound in the administration of some autovaccine or antitoxin which will control the toxamia of the disease, in conjunction with

the particular operative procedure best adapted to relieve pressure in the individual case. However, no one can read the splendid recent contributions of Dr. Haynes to the surgery of meningitis without at least being impressed with the reasonableness of the proposition there advocated.

Dr Haynes proposes, by opening the cisterna magna, to provide for free and continuous drainage of the injected cerebrospinal fluid, to relieve intercranial pressure, and restore a normal supply of blood to the devascularized vital centers Drainage from the cisterna magna possesses the great advantage of draining a deep and expansive cavity so situated anatomically and topographically as to offer a natural avenue for the gravitation of intercranial fluids and so favored by its structural conformation as to present pressure upon the drains with resulting enveloping adhesions and occlusion of the drainage canal The situation chosen for this craniotomy also admits of the ready inspection of the foramen of Magendie, and the easy removal of obstructing fibrinous adhesions from this important connecting channel should accumulated exudate offer an obstacle to drainage I arthermore, Dr. Haynes' operation is free from a complication which constitutes a serious objection to every other procedure which advocates opening the dura sufficiently widely to encourage any reasonable hope of efficient drainage, namely, it is not attended by hernia. The aforementioned advantages constitute in brief the chief arguments in favor of the Haynes pro-The fact that its performance has not been attended with success should not discredit it It is on trial, and thus lar has not had a fair chance, for it has been undertaken as a last resort in conditions which were in themselves hopeless. As a proposition it is reasonable. As a procedure it is as safe and simple as any expedient which is employed for the relief of conditions ol such extreme gravity can be expected to be, and we hope that when instituted early, as its sponsor properly demands, it may prove to be the curative agent for which we have so long and antiously waited.

PROSTATECTOMY¹

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NTIL within the past few years the perincal operation for removal of the hypertrophied prostate was the operation of choice in many hos-As an advocate of pitals in this country this method I would argue, first, that the mortality was less and, second, that the time of convalescence is shorter, since the perineal wound heals much more quickly than the suprapubic Studying the cases more carefully, however, I have found that the mortality is not directly a result of the operation, but that it depends upon the functional capacity of the kidneys and the condition of the beart and general circula tion, which is true with either operation Our mortality has been greatly reduced by proper preparation of the patient before operating.

For a number of years I have advocated

dividing the treatment into two stages First stage The first stage consists of rebeving the patient of the residual urine, and at the same time treating the cystitis if it exists Whether It is the mere presence of residual urine in the bladder or whether it is the backward pressure of the urine upon the kidneys which produces the deleterious effect I cannot say, but we are all aware of the harm that may be done by keeping the bladder empty when it has been accustomed to retain even a few ounces of residual urine The urine which is retained in the bladder should be withdrawn gradually, keeping the bladder empty for a longer period each day until no bad effects are apparent In many instances it will require several weeks to carry out this treatment, but it invariably results in a most marked change for the better in the general condition of the patient In about three fourths of the cases the requisite dramage has been accomplished by means of a permanent catheter introduced into the bladder through the urethra. In the remaining one fourth of the cases it

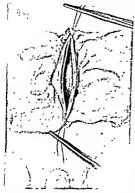
was necessary to make a preliminary suprapuble stab drain, because it was impossible to introduce a catheter or because the urethral catheter could not be worn with any degree of comfort

Second stage. After the reaction due to the withdrawal of the urine has passed, the specific gravity, which invariably falls with the introduction of the catheter, will again come up, and the second stage of the treatment, 1. e., the removal of the obstructing prostatic gland, can be carried out This procedure will be accomplished more satistactorily and with more safety than if the preliminary treatment had not been instituted

The functional result as regards the ability the patient to empty the bladder and, far more important, his ability absolutely to control the flow of urine, is the most important factor in the treatment of these cases. This result is attained in the perineal operation in a large percentage of the cases, but it is quite impossible to determine which will have poor control or which will have complete incontinence. In none of our cases following the suprapuble operation has there been any difficulty absolutely to control the stream, and in practically all of them the bladder can be emptied completely.

The work of Tandler and Zuckerkandl (1) and, more recently, the studies of Lowsley relating to the development of the prostate have shown that the middle lobe is independent and is the one which most frequently undergoes changes in a so-called hypertrophy. Lowsley (2) has shown that the anterior lobe shrinks unto insignificance at the twenty-second week, but that this structure may persist throughout life, as is evidenced by the occasional finding of enlarged anterior lobes at autopsy. The same author has also demonstrated that the posterior lobe of the prostate is an independent structure. Its tubules originate from the floor of the prostatic urethra below

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13; 1 Hadder lifted out of suprapolis, wound by suture in each end of incision. I dges of wound protested by pads of gauze.

the openings of the queulatory duets and are definitely separated from the other parts of the gland. A fibrous capsule intervenible tween this lobe and the lateral lobes. In their investigations on protate hypertrophy, Tandler and Zuckerkundl did not find the posterior lobe enlarged in a single instance, but found a condition of pressure strophy.

Boyd and Geraghity (3) state that primare carcinoma of the prostate array or never begins in any other part than us the posternal lobe. In operating through the bladder this lobe is not disturbed a point of practical value because of the close relation of this lobe to the ejaculatory duets. In the ordinary suprapubic operation for a benign superapub, the ejaculatory duets are not injured in any way, and the sxual state remains exactly as it was before the operation.

The chief disadvantage in the suprapubic method is the length of time required for the urinary fistula to heal, due to infection

in this poorly resisting suprapubic space It has not been uncommon to see these cases drain for weeks or even months, or to see a case terminate badly on account of extensive infection. In every other respect I believe the suprapubic operation is to be preferred, and within the past few years have operated almost entirely by this route. By changing some of the minor points in the technique of the operation I have undeavored to remove the gland with as little chance as possible of infecting the suprapulic tissues. After the gland is removed, the incision in the bladder is drained or closed in such a way that the timues are exposed as little as possible to infection

Technique - The abdominal incision is made in the usual was and the reeti muscles separated to is much better to make a large incision than to tra to work in a crowded space. The fat in the suprapublic space is dissected off from the fundus of the bladder and the pentoneum pushed back. It is very essential that the peritoneum be stripped well back and that the bladder be lifted up as far out of the abdominal incision as possible to have the bladder empty, since I have not found it advantageous to fill it with air or water or to open at upon a sound. Ordinarily the pentoneum is not opened but is stripped back from the bladder Occasionally, however, the peritoneum will be opened accidentally. This may occur to separating it from the bladder, or it may be done by the pressure used in shelling out a low-lying gland The first few times this accident occurred I was extremely fearful, but I have now opened the perttoneum in seven cases, each time closing the opening with cateur as soon as it was discovered In none of these instances did it make the slightest difference in the convalercence of the patient (lig 1).

With the funday of the likelider lifted will out of the addominal units on the ballommal wound is justed off with grace, the bladder, which a fee minutes before has been cleaned as thoroughly as prossible is most opened by free mensum, usually about 2 miles in length As soom as this opening has been augle of the gracino in the bladder and the organ deed by sponging out any accumulated united and the organization of the property of the contraction will be a superior of the property of the contract of the gracinos in the bladder of violes or white used in clearung. It is well at the stage of the operation to examine the bladder for violes or other lessons. This is expectably important if it has extracted in the contraction of t

With the gloved fingers of the right hand in the rectum, the gitned can be pushed well up into the bladder. The best and it necessary, the second fingers of the left hand are introduced into the bladder. We prefer to start the shelling out of the

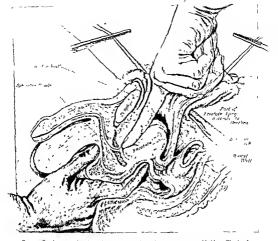


Fig 2 Forefinger of glosed hand in rectum pushing the prostate up into bladder. The forefinger of left hand entering prostatic exposed through prostatic vertical. (Elaborated from sungestive detech illustrating "The Choice of Operation for the Relief of Prostatic Dysuma and the Preliminary Treatment Indicated," by Dr. Paul M. Pigler J. Mark St. M. Ser. January, 1013.

gland by breaking into the prostatic capsult with the bare finger rather than by using an instrument to cut into it. In some instances, however, especially when a catheter has been used for a great many years, the mucous membrane of the prostatic urethra may have become so toughened that it will be necessary to start the enucleation by cutting through this membrane, since to break through would cause too much traumatism. Ordinarily the tinger pushed into the prostatic urethra very quickly breaks into the capsule Oftentimes on either side of the prostatie urethra, the hypertrophy rounds into the urethra and makes a convenient place to start the enucleation. If necessary, the entire circle of prostatie urethra may be removed. It will re form quickly, and there is no danger of the formation of stricture On a number of occasions I have removed the entire circle of prostatic urethra

It is customary however, to start shelling out the gland at one lateral aspect of the urether and to reduce the start of the start of the urether and to start of the start of

For several reasons it is most important that practically the entire gland be removed, and the fact that the entire gland can be removed by this method is probably one of the best arguments in favor of the suprapsible over the perincal route

The prostate is entirely surrounded by the fibro-



Fig. 4. Bladder supported in some fly stratic a sutures in ends of incision. Bludder being sutured by insertupled ratgut suture. Sutures in little all coats except minosa.

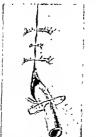
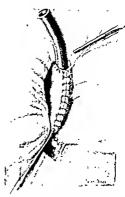


Fig. 5. Showing method of draming suprapulse, space when the bladder has been closed completely. Tube is placed in lower angle of wound and extends downward between the rectumuseles to the will of the bladder.



for a Showing rubber draining table held by pure string subtar in upper and of blather wound—a method employed when the blathler is builty infected and bletting seems too free hit complete theure of blathler.

muscular capsule When the gland has been cont pictels enucleated, the cansule contracts quickly and the hamorrhage stops in a very short time If however, a piece of the gland be left to the capsule it acts the way a piece of retainful placents acts I e interferes with the contraction of the capsule and thus keeps up the bleeding. The hemorrhages in these cases have been a source of anxiety to sur geons and many devices have been shown to con trol them At the present time however, I behere that if enucleation be clone within the capsulo and the prostate be entirely removed a gauge pack will seldom be needed to stop the bleeding. Sharp harmorrhage may be a rused by dissecting nutside the capsule into large vessels or by leaving a piece of the prostate in the capsule If the enlarged gland be entirely removed, the capsule will contract and the bleeding will be only that which oozes from the edge of the mucous membrane in the urethra and bladder As soon as the gland is shelled free from its capsule and the urethra is torn off the catheter, which was introduced into the urethra before the operation was begun, is passed through the prostatic capsule into the bladder and irrigation commenced

The irrigation must be commenced as soon as

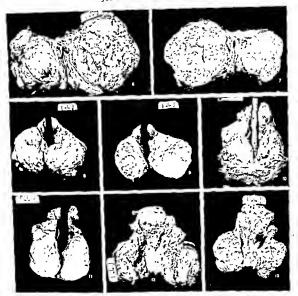


Fig. 6. Anterior view of large prostate in which the hipertroph has produced bilateral enlargement of gland lig. 7. Section through specimen shown in Fig. 6 showing glandular type of hypertrophy with many small cysts in the enlargement seen on feft of picture. On the right the collaptement is smaller and constains much fibrous

Fig. 8. Antenor view of prostate in which the byper trophy has produced two lateral enlargements and a small median enlargement. A catheter his been passed through the prostate urethra.

the upper portion of jucture behind eatherer Fig. 9 Section through spectimes shown in Fig. 8 Catheter still shows in prostatic arrethra. Glandular type of hypertrophy with considerable amount of fibrous tissue and many small cysts. Fig. 10. Interior view of prostate, with two lateral and a median enlargement. Catheter placed in prostatic urethra. In lower portion of picture lateral enlargements are held together by tough fibrous band. Urethra passes beneath band, and opening shows on lower border of

picture
Ing 11 Section through specimen shown in Fig 10
Note the narrowed urethral channel which will not permit
the passage of eatheter Glandular type of hypertrophy
with small exist and much fibrous resue.

Fig. 12 Antenor view of prostate in which hypertrophy has produced two lateral enlargements and a median enlargement.

Obstruction caused by median enlargement.

Fig. 23 Section through specimen shown in Fig. 12 Glandular type of hypertrophy with many small cysts and small amount of fibrous tissue.



Fig. 14. Anterior view of prostate in which the hypertrophy has produced two lateral enlargements and a median enlargement. A catheter has been passed through the prostatic urethra. Median enlargement shows above, to left of entheter,

the gland is shelled out, to prevent the accumulated blood from clotting or to wash out the clots which have accumulated in the bladder. The first appearance of clots and blood may give the impression that a sharp harmortage is about to occur but if the irrigation be continued a few minutes the flow clears up, and from then on the bleeding will amount



Fig. 15 Section through specimen shown in Fig. 14 Note tortuous and obstructed urethral channel. Glindular type of hypertrophy with many small cysts.

to lattle or nothing. Free irrigation is kept up for several impacts, washing through and through she bladder, which is constantly supported as free out of the wound as possible by the stures in the two angles (Fig. 3). As the irrigation continuer interrupted suttrees of caight are placed in the introduced through the control of the c



Fig. 16 Large irregular shaped prostate which weighted 8 ounces. Hypertrophy has produced two lateral enlargements which projected high into the bladder. Urethral channel passes through bottom of concavity, which shows in upper portion of fland.



Fig. 17 Section through specimen shown in Fig. 16 (unfixed specimes). Urethral channel passes through bottom of concavity shown in upper portion of the gland Glandular type of hypertrophy with hulging adenomatom areas.







Fig. 18. A literal enlargement, from a prostate which his been opened and photographed in unived state. A large admonstrous area has been a choned and shows in each half. Similar smaller areas also show. In unfixed specimens these allenomitous areas prutrude or bulge outward after the phrous tissue surrounding them has been cut

Fig. 19. Small filtrous prostate with slight hypertrophs. Obstruction caused by median enlargement, which shows in upper part of picture, behind catheter A tough abrons band surrounding prethral anal shows in lower portion of picture Liz to Specimen shown in Fig. (6) on section. Dark area in center of picture is provide urethra. Median enlargement which caused obstruction shows in upper portion of picture. Glindular hyperteephy with small cysts and much abrous tissue

remaining Should the ouzing continue to an extent to clot the urethral catheter while the bladder is being closed a small tube is introduced at the highest point in the incision (Squier) and the irrigation made continuous passing through the catheter and out of the suprapuble tube (Fig. 4) This tube should be sutured accurately into the bladder in the same manner that the tube is sutured into the gall bladder to prevent leakage As soon as the patient is put in bed constant irrigation is commenced and kept up until the cleanung water is clear. This will ordinards take 24 sometimes 48 hours. The tule is then removed. In many of the cases there will he little or no drainage from the wound afterward

The hladder is washed frequently through the urethral eatheter, which is left in place until the wound above has remained closed for several days When the sutures have been placed in the bladder, if there is no difficulty due to closs and if the cleansing water is returning clear through the urethral catheter the wound in the bladder is closed completels and a small tube introduced to drain the suprapubic space (fig 3) If the bladder be com pictely closed it is necessary to have either a two way catheter for constant irrigation or have a nurse syringe out the blackler every few minutes until all signs of oozing have stopped. In some of our cases there has been difficulty from clots during the first few hours following operation, though usually fre quent irrigation and the use of alum water will stop the oozing so that at the end of 12 hours it will not be necessary to syringe out the bladder oftener than once every hour When the cleansing water returns clear the first catheter is removed, and a clean, sterile one reintroduced. It may require some adjusting to place the catheter in the proper position in the bladder so that spasms will not occur. However the majority of the cases are entirely com-fortable with the catheter in position. The catheter

should be changed trequently but should be kept in the urethra until the suprapulic wound has remained entirely healed for several days will usually take from two to three weeks ligs 6 to 20 showing specimens)

Two or three silkworm sutures are placed in the abdominal wound the recti muscles being included The wound is not closed completely But few of these wounds heal by absolute primary intention, there will be a bettle serum drainage and in some cases urmary leakage for two or three weeks. I have had a few cases in our clinie in which the sunrapulse space became infected in the way that sometimes followed the old method of packing the wound with gauze

The chief points in favor of this technique in the suprapubic operation may be enumerated as follows: (1) Patients are much more comfortable during the period of convalescence, (2) they do not have to contend with the urine-soaked dressing, and (1) the run of temperature due to absorption from infection in this space is avoided While these patients require considerable care during the first 24 hours following operation, after that time they are much easier to care for requiring very little dressing

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ACUTE PERFORATIVE CHOLECYSTITIS COMPLICATED BY GENERAL PERITONITIS

WITH A REPORT OF TWO CASES

BY CHARLES M REMSEN, M D. ATLANTA, GEORGIA

THE comparatively infrequent occurrence of the pathological and surgical condition, acute perforative cholecy stitis, as compared with the more common pathological conditions with which one meets in the biliary tract, and its bearing on certain arguments for and against operation on the "acute gall-bladder," warrant consideration of the two following cases:

CASE 1.1 P S. Polish (emale age 45 Tire days before admission, was seized with sudden pain in left hy pochonifrium and back, so severe that patient cried out Pain passed over to right iliac fossa in 12 hours Vomiting severe at onset, bile stained, has persisted Chill lasting one half hour at onset. none since then Complete anorexia and constipation and increasing abdominal tenderness since then No bladder symptoms General condition poor unchanged last three days. Similar attack three vears ago lasting only 24 hours Examination W B C 20,000, temperature 103 pulse 132 General condition poor Jaundiced, bowels not moved by enema Abriomen moderately distended, especiatly in lower half Gastric peristalsis visible Distinct fullness to right of and slightly above umbilious, seems to descend with inspiration Ab dominal walls move with respiration Palpation reveals mass in right iliae fossa, suggesting appendix ubscess In right upper quadrant there is a mass showing outlines similar to an enlarged gall bladder. very superficial and moves with respiration, and extends rx cm below costal margin in parasternal line Inner and lower margins fairly definite, outer indefinite due to muscular rigidity, is continuous with liver, and passes up under costal margin Dull on light, slightly tympanitic on heavy, percussion Surface irregular, nodular, exquisitely tender Gas troptosis and gastric dilatation present. Liver dullness reached 1 cm below costal margin dilatation of the stomach pushes mass to right No mass felt on stomach surface Dilatation of colon demonstrates mass to be in front of this Diagnosis Empyæma of gall bladder, carcinoma ol gall-bladder. or caremoma of pylorus with infection

Operation 36 hours later by Dr Remsen, when permission was gained Gas anæsthesia, right rectus meission Opening pertioneal cavity re-alid a quantity of free greenish turbid fluid. Liver expections that the control of the control of

amination directly attached to lower border livet in gall-bladder region. Slow blunt dissection revealed to the property of the property of the property of the tion partially scaled by inclusive participation of the adherent stomach, pylorus, and duodenum. Large amount foul smelling puse a vacuated carefulls from gall bladder, together with numerous faceted calcultion in the bladder and cystic duct (Fig. 1). Choleys to stomy. Drainage. Discharged well ensuing to the property of the present of the present of the present to stomy. Drainage. Discharged well ensuing adult of the present of the present of the present of the caster.

Case 2º A S. Italian male. Onset three days before admission, with sudden acute pain over caute lower addomen. Neuves, anorexa, constipation imediately set in. Fain persistently and graduily increased, involving entire abdomen, but tendentes as settled more especially in right liag fosts. Last 18 hours patient has been unable to urnate, last 18 hours patient has been unable to urnate, last might pain was excrucating throughout entire abdomen. Similar attack three years ago, 15 days in hospital in New York, but refused operation.

Examination W B C 14,500, lemperature to No jaundice Addomen slightly and equally included Respiratory movements shallow Deep respiration elicitist great pain over lower abdomen No masses, no pertitablis Shgat bulging in faints mutualized sommal Costal margin obliterated Rigidity over entitre abdomen, greatest over lower quadrants Tenderness everywhere Most as centiusted at right that fossa Deep palpation not possible Flanks dull Dome trimpaintle Loud dillness normal Diagnosis general pentontiti-Cause unknown — appendictor favored

Operation immediately, by Dr Remen Gas and ether annushesia Repli rectus incisson Operang peritoneal cavity reveals large amount for strongly belanged, purilout shud Justismes greatly distended Appendix presented, adheren Phis was excised Pylonic and guil-bladder region explored. Ruptured; gall bladder, surrounded by the peritoneal strongly and properly and consider forms inserted (Fig. 2) Discharged well at end of four weeks. Culture laken at operation

In all probability the underlying cause of the perforation was infection, indirectly closing the cystic duct, distending the gall bladder and weakening its wall, and ultimately ending in accross of its wall Circulatory

Referred by Dr Robalte

Referred by Dr. Frank Smith



disturbances secondary to infection or to the mechanical factors of pressure, and even the direct pressure of the calculi (Case 1), may have been factors in the necrosis as well Both gall-bladders showed a markedly thickened ædematous wall, the lining mucous membrane being swollen until it resembled a thick red gelatinous coating The gangrene present in Case I was limited to the base of the fundus, and the perforation was situated in the middle of this area The mucous membrane around this area was intensely inflamed and showed many hemorrhagic The perforation in Case 2 took the form of a slit along the side of the fundus, and the wall along its borders was similar to the wall of the remainder of the fundus Faceted calculi in numbers were found in Case 1, whereas in Case 2 none was located after a rapid search In neither case were there any gross changes suggestive of malignancy.

Inability to obtain more than meagre histories in both cases prevented ascertaining most important guides to the diagnoses. In neither was there a hint of pain in the gallbladder region before the acute attack. In



both, the attacks were ushered in with acute abdominal pain, yet this pain, first felt in the left hypochondrium and back (Case 1), or in the lower abdomen (Case 2), was certainly neither distinctive nor even suggestive of the organ from which the generalized spreading of the infection started. The shifting of the pain and tenderness to the right iliac fossa - an evidence of the action of the mesocolon in guiding fluids from this region along its outer side to the right iliac fossa and pelvis - was evidently due to the continued renewal of infection along the track pursued by the pus and led to a tentative diagnosis of appendicitis (Case 2), where this increased local tenderness was the only distinctive feature in an abdomen generally distended and painful on pressure. In Case r the same phenomenon had occurred and the right iliac fossa showed increased tenderness, but here the mass of cedematous omentum partially surrounding and sealing the perforation in the gall-bladder pointed more plainly to the real cause of the flooding of the general cavity.

Before discussing generally the several points of differentiation in such cases, it might be well to tabulate the similarities and dissimilarities of the signs and symptoms of the two concrete examples already mentioned.

igean1	Duration	at onest	Lecation of Juan	Pain		Part Shifted
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N a	3 days	full feat acute [400 (alubom page)	Futire lower abdomen	Persited		To R F
f'eritones/ symptoms appeared in	Tenderness greatest m	‼ ti (x∞l Temp	Totemu	Operation	Perstonest flui I	rapture
last so hours	R I I and over	26 000 101	Marked	36 hours	Duantny Turted Lifeen	Base of tastus
last 1x hours	RII	#4 too bot	Makel	Immediately	Quant ty (urlad Green	Side on Gall Bi
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The problem requiring solution is, whether the condition has originated in the biliary tract or not, and if so, what the nature of the pathological condition is. The points of differentiation must either hinge on the early signs and symptoms, or, when once the general peritoneal signs have overshadowed the local conditions, on various points in the previous history. In the latter, one must search carefully for suggestions of gastric and duodenal ulcer, for indigestion, pain and its relation to the ingestion of food, hyperacidity. hamatemesis, melana gall-tones, infection in the biliary tract, Charcot's intermittent fever. chills and jaundice. Lung conditions must be gone into carefully; pneumonia and sub diaphragmatic pleurisy excluded, as well as heart conditions causing painful liver conge-tion; intestinal contents examined for a

possible cause of liver absects or for conditions suggestive of pancrealitis, inflammatory conditions in the appendix—for all these the history must be carefully scarched, not so much with the desire to elicit numerous symptoms which may be applicable to any or all of the members of this physiological group but rather to discover some one symptom or set of symptoms which may be particularly characteristic of one certain organ in this group

Close application to these details may guide us at the time when our difficulties are greatest—at the onset. One must be called upon to differentiate the pain of hyperacidity from the pain of pancreatitis, the pain of pancreatitis, the pain of pancreatitis from the pain of a leaking uler, the pain of gall-tone coffe from the pain of perforating gall-bladder, and so on throughout the whole last of possibilities in this region.

Current study of the blood picture, the leavestees, the temperature, examination of the stools—any of the aids may give us our lead at this critical time when the surgeon must take upon himself the responsibility of deciding whether operation should or should not be performed

Later the conditions change, and as the signs of early spreading peritonitis appear we are able to rule out many of our earlier possibilities - the heart and lungs are discarded as a cause, the passage of calculi, the acid crisis, must give way to some more definite pathological condition which is resulting in a mechanical soiling of the peritoneum and in fection in this cavity Still we are confronted by various possibilities Diverticultis may lead to an extension of the inflammatory proc ess into the surrounding peritoneum, hepatic abscess; perforations of the hollow viscera in this locality; pancreatitis, thrombosis of the mesenterie vessels, even appendicitis and suppurative kidney conditions must yet be exeluded as far as is possible by the various signs and symptoms peculiar to them, before a serious consideration can be given to the biliary tract. Tenderness alone should not be relied on, as this may be very misleading. as was seen to be the case in both of our examples. Jaundice is an aid, but actually is present in only a small percentage of the cases. When present, the existence of calculi in the ducts must be considered strongly.

Again, we may find ourselves thrown back upon the previous history, where symptoms of biliary calculi or biliary tract infection—most olten not recognized by the patient, and often suggested to us only after some history of "malaria" or "typhoid" has been carefully analyzed—will at least warn us, symptoms which are othen similar to and indefinitely overlap those of that physiologically connected group of organs in this neighborhood, but which again, on the other hand, might in a certain proportion of the examples stand util in sharp contrast to the symptoms arising from near-by structures

Later still, if we are confronted by the consequences of the ruptured gall-bladder where bile has escaped freely into the peritoncal

eavity, our local conditions may be entirely blanketed by the general abdominal signs; and though our indications for operation are definitely outlined, yet we may be entirely in the dark as to the origin of the calamity (unless our previous history is pointed) until the opening of the pertioneal cavity reveals the free bile-tinged fluid nearly always characteristic of a ruptured billary tract — "nearly always," because in a small number of cases this has existed with the presence of an intact biliary tract so far as could be discovered by the eye.

Operative procedures may frequently require speed, a factor which, if neglected, may be of serious moment to the patient. The appearance of the greenish fluid free in the peritoneal cavity must require immediate exploration of the biliary tract. Chances favor the existence of bacterial inflammation of the peritoneum, since we are dealing with the spontaneous rupture of the gall-bladder, Certainly a potential, if not an actual, peritonitis exists Having located the perforation as rapidly as possible, a cholecystostomy should be performed. Perhaps the rupture itself may be used as an ostium through which to insert the rubber drainage tube into the gall-bladder This was done in both of our cases Protecting and counter-drains are inserted as indicated, and the peritoneal cavity carefully and gently "mopped" out. In a small number of cases, perhaps, cholecystectomy should be considered, especially where gangrene is present, and where the danger, then, of this process extending to neighboring structures exists. Unless especially indicated, it hardly seems reasonable to submit the patient to this more serious operation, except when his condition is such that one feels no alarm as to the outcome.

Finally, it should be borne in mind that acute perforative cholecystitis, though rare, does in fact exist, and the possibility of this condition operates strongly against following any fixed rule designed to permit attacks of acute inflammation of the gall-bladder to subside without operative interference, and should place greater responsibility on the surgeon who is watching such a case. The infrequency of this condition should not allow

one to dismiss it, in differentiating those early cases where perhaps pain in the right upper quadrant is the only predominating symptom, nor should one forget, in those frequent cases with which one meets, after all local signs have been far overshadowed by the subsequent peritoneal inflammation, that the

gall-bladder, as a causative factor, must be reckoned with seriously.

I wish to thank Dr. William S Ilalsted for his kindness in allowing me to report these two cases, which occurred while I was in his sertice at the Johns Hopkins Hospital as resident surgeon

POST-OPERATIVE RESULTS OF AMPUTATION OF THE CERVIN

FROM THE GYNECOLOGICAL CLINIC OF THE JOHNS HOPKINS HOSPITAL BALTIMORE

BY \ \ LEON \RD, PH B, M D, BALTIMORE

Avolant Replect General gest John Hopkes florgeral

MPUTATION of the cervix was prob ably first advised by Ambroise Paré, and, about a century later, by Tulipus of Amsterdam - 1652 Osiander, in 1802, performed the operation several times Later, the operation was given considerable repute throughout France by Lisfranc, Duputren, Récamier, Hugier, and others During the first half of the nincteenth century. the operation was practiced almost exclusively for carcinoma of the cervix The amputation was performed by means of the bistoury and ecraseur, the raw cervical stump being allowed to heal by granulation In 1887, Byrne introduced a method of amputation with the electrocautery. His method had a great vogue, particularly in France, and great stress was laid upon its special efficacy in malignant cases Sims, in 1861, introduced the first plastic operation on the cervix, advocating the use of a vaginal cuff of mucous membrane to cover the stump

Operative interference for the common pathological conditions of the cervits, such as chronic endocervicitis and laceration, only came into general use during the latter doc ades of the past century, mainly through the work of Sims. Enumet, Heger, Simon, Marck, and Carlor Schroeder, and later, through Poucy, Pozzi, Jayle, Simpson, and many others. The various procedures introduced by these surgeons gave rise to a rather extensive literature between 1885 and 1900,

in which the relative merits of each method is discussed at eonsiderable length Before long, however, two methods gained prominence over all others. Throughout Europe, Schroeder's operation soon eame into general use, while Emmet's trachelorrhaphy became the method of choice throughout England and America

Between 1800 and 1000, there appeared a number of articles and monographs, for the most part of French or Italian origin, reporting the post-operative results of amputation of the cervix A numbur of cases of dystocia, due to post operative cicatricial stenois of the cervical canal, had been reported, some due to amputation of the cervix, others to cauterization L3k.esi/se an uncreased liability to abortion and premature labor, following the former procedure, had been pointed out

Ducases in 1889, concluded that amputation of the cervix interferes in no way with the normal course of pregnancy or with the dilatation of the cerix during labor, but admitted that in the event of post-operative cicatrical stenoses, consequent upon an atypical operation, obstetrical complications might ensue Pescher, in a monograph published three years later, admits that the occurrence of premature deliveries may be somewhat increased after the operation, but that ordinarily the normal course of pregnancy is uninterrupted Contrary to Ducases, however, Pescher states that after Schroeder's

1 Rea I before the American Gynecological Society May 20 1012

operation the majority of cases are attended by serious difficulty during labor, due to the inelastic quality of the cervix On the other hand, Pedobedoff, in 1895, concluded that after this operation pregnancy progresses normally, and labor is unattended by difficulties, qualified by the statement, however, that in certain cases dilatation of the cervix may be somewhat retarded and that the incidence of premature delivery may be slightly increased Martin, in his monograph published ten years later, reporting numerous cases, states that post-operative cuatricial rigidity of the cervix may be the cause of serious obstetrical mishaps to both mother and child Likewise Audebert in 1898, in a monograph entitled 'Pregnancy and Labor after Amputation of the Cervix? insists that the operation exercises a marked influence upon, firstly, the duration of subsequent pregnancies, in causing frequent abortionand premature deliveries, and secondly upon parturition, by the frequent occurrence of premature runture of the membranes, and in certain cases by causing cicatricial stenosis of the cervical canal. He admits that the latter complication is only liable to follow an atypical operation Nevertheless, Pozzi states that none of the divers operations on the cervix compromise the ability of that organ to dilate readily, but give rise merely to innocent cicatrizations which in no way render the cervix less elastic Numerous observations, he says, have proved that neither sterility nor dystocia need be feared while de Koninck refers to this opinion as one of "exaggerated optimism". He makes no mention of the question of premature delivery Likewise, La Torre, another Italian author, is flatly in favor of the operation in all cases, stating that no evil consequences need be feared provided accurate approximation of vaginal and cervical mucosa is obtained Quite in accordance with these authors are Doléris, Chalieux-Vivic, Morisani, and Pichevin while Duponnois, in a monograph pub lished in 1901, even concludes that, following amputation of the cervix, labor is merely rendered shorter and easier On the other hand, Lepage, Pinard, Tarnier, Boudin, McPherson, Flandrin, Porak, Potocki, Fabre,

Taurin, Caillon, Dumouly, and others have discussed the possible obstetrical consequences of the operation from the opposite viewpoint. Guibout, in an extensive monograph published in 1900, concludes from a careful analysis of 145 cases that the liability to abortion and premature delivery is increased after cervical amputation, and that serious dystoca may result, but that the operation undoubtedly augments the liability to subsequent impreenation

sequent impregnation Just lately, the controversy seems to have been dropped entirely, practically nothing having been written on the subject for several years while the field of dissension has meanwhile been left deserted for complete occupation by the enthusiastic advocates of the operation. The assertion seems justifiable that, almost without exception gynecologists, in this country at least, regard amoutation of the cervix as an operative procedure free from sub-equent complications, barring, perhaps, the occasional occurrence of post operative hæmorrhage Yet it would seem, from a consideration of the report to follow, that this operation, though often the procedure of choice and of incontestable value in many cases cannot be indiscriminately practiced without the occurrence of subsequent obstetrical consequences more or less serious

At Dr. Kelly's suggestion. I have prepared an analysis of the post-operative histones of the cases of amputation of the cervix performed in the Gynecological Clinic of the Johns Hopkins Hospital, with the object of determining, first, the efficacy of the operation as a curative procedure, and second, its effect if any upon mentruation, impregnation, pregnancy, and parturition. Of the circular letters sent out, 128 replies were received which were complete enough to include in this report.

METHOD OF OPERATION

Almost without exception, a high amputation had been performed, from 3t 6 to 3 cm of the excivaabove the external on being removed. The operative procedure in these cases may be given as follows. The crevix being exposed by the introduction of a posterior retractor, it is grasped with tenaculum forceps and drawn will down towards the vaginal coultet. A circular incision is then carried completely around the cervix at a level about 1 to 11/4 cm above the external os The cuff of vaginal mucous membrane thus released, together with the bladder, is then dissected well back, and the amputation completed at a point 21/2 to 31/2 cm above the external os The bleeding is then controlled and approximation of vaginal and cervical mucosæ obtained by the introduction of interrupted sutures of formalin catgut, the needle being introduced at the periphery and carried through the cervical canal In a few of the cases, the typical "cartwheel" closure was done. In most of the cases, a special suture was taken at the lateral angle, the vaginal cuff being turned out and the edges approximated anteroposteriorly, either with a figure of eight suture or with a special suture now used extensively in this clinic, namely, beginning at the periphery anterolaterally the needle is introduced to come out at or near the cervical canal and is introduced again at a point just below this to come out posteriorly at a point on the periphers opposite the original point of entrance. This suture controls hamorthage at the lateral angles remarkably well, and at the same time gives very good approximation of the edges of the vaginal mucosa

A - IMMEDIATE POST-OPERATIVE RESULTS

In six of this series of cases, or 4 6 per cent, post-operative homorrhage occurred severe enough to necessitate the removal of the patient to the operating room for resuture of the bleeding cervix.

There seems to be no time, however indefinite, during the patient's convalescence at which this complication may be expected In only one of the six cases did the hamorrhage take place on the day of operation. In one case the bleeding came on the second day, and in another on the third day the other three cases, severe bæmorrhage occurred at a time when the ordinary case is considered out of all danger - one on the ninth day, another on the eleventh, and a third on the twenty seventh day after operation A careful review of the operative notes and post-operative observations by the ward doctor in these six cases reveals nothing to account for the complication in any instance

In three cases hamorrhage occurred soon after operation and was due in all probability to insufficient or faulty suture of the cervix. By bearing in mind the following points, cases of early hamorrhage could be largely avoided:

1. Great care should be taken to tie the cervical branch of the uterine artery which runs along each side of the cervix quite superficially. A good plan is to tie these off, high up, as soon as the vaginal cuft has been dissected back — a procedure which materially reduces the bleeding during the operation

 The radially placed sutures should be of strong, twenty-one-day catgut, formalized or chromicized. The use of plain catgut for these sutures, as practiced in some clinic.

is dangerous.

 Care should be exercised not to tie the sutures so tightly as to cause strangulation of tissue and consequent sloughing.

Why serious hamorrhage should occur several days, or even weeks, after operation, rather than within a few hours, seems at first difficult to explain It is inconceivable that thrombosis should not ensue, even in the largest cervical vessels, within a day or two at least. For late post-operative hamorrhage another explanation must be found, and infection seems to he the only one likely to adequately account for the complication The existence of a low grade or latent endocervicitis in cases coming to operation for cervical disease is very common, indeed al most the rule. Amputation, or any other surgical procedure upon the cervix, certainly tends to enliven such chronic infections, a fact well evidenced by the profuse leucorrhos which usually follows for a period of several weeks It is not unlikely that such an infection might in certain cases open up a vessel some time after operation and cause sharp hæmorrhage

It is exident that the operation as ordinarily performed is not without considerable danger when we consider that in nearly five per cent of the cases severe post-operative hamornhage may occur, and this long after careful watching for such a mishap is considered necessity, or even after the patient has been discharged

B - REMOTE POST-OPERATIVE RESULTS

r. General health. In all but 13 cases of this series, amputation of the cervix was combined with some other operation. In comparing the patient's general health before and after amputation of the cervix, it is, of course, necessary to consider the part played by any other operation, simultaneously performed, in improving the patient's general condition. For this reason, the cases were divided into three groups, according to the operation: r Those cases in which an amputation of the cervix alone was done, 2 Those in which the repair of a relaved vaginal outlet followed; 3. Those cases in which the abdomen was oppend The result, as shown by the following tabulation, is striking

About or per cent of the entire series of 128 cases reported noticeable improvement in general health In only 8 cases, that is, 614 per cent, was there no change in the general condition, while 5 cases, or about 4 per cent, reported subsequent impairment of health. In view of the fact that amputation of the cervix was the only operation per formed in all the cases, it seems somewhat significant that in each group about oo per cent reported improvement The percentage in each group being so constant it is perhaps not unreasonable to assume that the operation common to all of them was, at least, largely responsible for the change, particularly when we consider that or per cent reported improvement where amoutation of the cervix was the only operation performed Duponnois (1001) concludes that amputation of the cervix, even when unsuccessful in curing an old endocervicitis, is followed by a diminution in leucorrhœa and a general betterment of the patient's health On purely theoretical grounds, ample justification may be found for such an assumption The beneficial effect of the removal of such foci of chronic infection as the tonsils, the appendix, or even the radical cure of an oral sepsis, has been incontestibly proven. Reasoning by analogy, why should not the removal of the uterine cervix. so often the seat of chronic infection, have a similarly beneficial effect upon the patient's condition?

2. Leucorrhaa Of the 128 cases analyzed, 109 cases, or 85 per cent, had leucorrhaa before operation Sixty-eight cases, or about 62½ per cent, of the group reported themselves entirely cured of it Thirty-three cases, or 30 per cent, reported noticeable improvement.

Eight cases, or 7½ per cent, reported the leucorrhoa unimproved, while one case declared it to be worse since operation.

Almost without exception, the patients left the hospital with some vaginal discharge. In 42 cases, or 38½ per cent, the discharge disappeared or underwent marked improve-

ment within one month
In 24 cases, or 22 per cent, the same results were obtained within two months,
making a total of 60 per cent of the cases

cured or improved within two months. In 13 cases, the discharge lasted about six months, while in 6 instances, it lasted nearly a year In 3 cases, the leucorrheae endured more than two years, and then stopped entirely in 2 cases and underwent marked improvement in the other In but 9 cases, or about 8½ per cent, was there o improvement in this respect. A review of the operative notes of these 9 cases yielded nothing to account for the failure of the operation to cure the leucorrheae, except in one instance where a particularly low amputation was done

In view of the fact that of the rog cases, or per cent reported either cure (6x per cent) or marked improvement (30 per cent), amputation of the cervix would seem to be an admirable method of combating persistent leucortheca of cervical origin.

3 Menstruction The effect of amputation of the cervix on subsequent menstruction is marked in one respect, namely, the occurrence of menstrual pain So far as this series of cases shows, there is no effect upon either the frequency of menstruction or upon the amount or character of the menstrual flow, yet Dr Russell tells me that in a few of his cases, marked menstrual irregularities following the operation have occurred

The incidence of menstrual pain before and subsequent to operation is shown in the following tabulation of the rog cases, which could be used for studying this question. The cases have been divided into three groups, according to operation, the same classification being made as above when considering the effect upon the general health.

OCCURRENCE OF MENSTRUAL PAIN BEFORE OPERATION

Grinaji		An Cases	L'asti	/unc	before nor after	æ
, '	Ampatation alone With perincorrhaphy With at dom, section	41 2.	13 (144)		operation 3 cases 10 cases e cases	

OCCURRENCY OF MENSTRUAL PAIN AFTER
OPERATION

roup he tases Less Pain he change More pain Amoutation time 8 4 or 50° 4 or 50°. None With temperorrhaphy 4 21 or 50° 22 or 50° 5 or 10° 6 With abidim arction 5° 21 or 50° 6 or 10° 6 or 10° 6

It will be noted that in Group 3 the percentage of the cases reporting decreased as well as increa-ed men-trual pain is higher in each case than in either of the other two groups. This is more or less to be expected, as will be appreciated by a glance at the following table, showing the type of abdominal operation done in the cases of Group 3

ABDOMNAL OPERATIONS IN GROUP &

APPOARTAL DISKALIDAS IN CROCK	3
Surjention and appropriately	44.50
Slynmectomy	1 (4
Removal of one tube or one gram	19
Removal of both tubes	44
Ligation of both tubes	2 68
Chalecystatomy	2 Ca:
Nephropery	2 Car
(I) stervicomy	612

Of the six cases in this group complaining of increased menetural pan after operation, a ventral suspension of the uterus and appendectomy were performed in three cases. a modified fulliam suspension of the uterus and appendectomy in one case, and a myomectomy in two cases.

To sum up 17 cases of 100 analyzed had no pain during menstruation either before or subsequent to operation—a number which seems very small when it is considered that almost without exception these women were multiparse. Of the 02 cases remaining, 54 or nearly 59 per cent, noticed marked reduction in menstrual pain subsequent to operation. No change is reported in 27 cases, while 11 patients declared their menstrual pain to be decidelly increased Of this last group, 6 had had abdominal operations.

Whether the reduction of menstrual pain in the 54 cases observed can be partially attributed to amputation of the cervix may be somewhat questionable. Some observers have attributed menstrual pain to cervical lacerations in certain cases, and,

granting that in certain cases of Group 3 the decrease was mainly due to the suspension of a retroflexed uterus, it may be again noted, as when considering the effect upon the general health, that a rather remarkable constancy exists in the percentage of cases reporting improvement in each of the group. As before, it may not be unreasonable to assume that the amputation of a diseased excrise was the main factor in effecting this result, the operation being the only one common to all the cases.

4 Influence of amoutation upon the occurrence of subsequent pregnancy. Many pathological conditions of the uterine cervix have long been pointed out as causes of sterility. Cervical stenosis or atresia, hypertrophic elongation, and acute anteflexions or retroflexions are among the mechanical obstacles to the spermatozoa which have received much attention Again, in chronic endocervicitis, the secretion of the infected cervical gland has often been demonstrated to be a material extremely inimical to the activity of the sperm, while the impenetrable plug of mucus which is often found in the eervical canal in these cases has been noted by Guibout, among others, as a mechanical obstacle of some importance When sterility exists in the presence of such manifest causes, the logical procedure, amputation of the cervix, at once presents itself

Lutard says, "Since Sims, the treatment of sterlity in the female is rather surgical than medical," while Champetier de Ribes, Scanzoni. Sins. Simpson Pozzi, Guibout, La Torre, Barnes Mangia, Morisani, Duponnois Peccher. Doléris, and many others have turnished evidence of the truth of this statement by the report of hundreds of cases of sterility cured by amputation of the cervix alone. All are agreed that in certain cases amputation of the cervix is the procedure of chnice.

For the purpose of studying the influence of this operation upon the occurrence of subsequent pregnancy, the cases were divided into two classes.

A Comprising all marned women under 40 years of age at the time of operation, who are menstructing regularly now. B. Including (1) women over 40 years of age at the time of operation; (2) cases who have passed or are at present in the climacteric; (3) cases of double salpingectomy.

In the first group there were 72 cases, women in whom the occurrence of pregnancy would naturally be expected. Yet of this number but 14 reported the occurrence of subsequent impregnation—about 19.4 per cent. In view of the observation of Mangin (1895), who, in following 44 cases reported subsequent pregnancy in 26, these figures seem very low. On further analysis of the 72 cases of Class A, however, a few facts were brought out which make the results somewhat less disappointing

In the tirst place, 34 cases of the 58 in Class A remaining sterile after operation were operated upon during the past three year, and therefore can hardly be considered sterile yet To state this consideration dif ferently the average time of operation among the 14 cases reporting pregnancies is 6 years ago while the average time of operation in the sterile group of 58 cases is but 3 years 8 months ago. In other words, the group of 58 cases so far remaining sterile since opention should be allowed a years 4 months more before the results could be absolutely compared Secondly the average age of those women who hecame pregnant was, at the time of operation 28 years 4 months, while the sterile group averaged 4 years 2 months older

It is of considerable interest to note that to of the 14 cases reporting fertility, or about 70 per cent, have had two or more pregnances since operation. Of the remaing 4 cases, 3 were operated upon recently, one each in 1908, 1900, and 1910. The fact that a large majority of the fertile cases had two or more pregnances after operation, while 80 per cent of the 72 cases of Class. A remained sterile (although 90 per cent of the latter were multiparce), would naturally lead to the assumption that in the latter group there exists some condition in the cervical stump, such as

If his end considered lighton of the Fallopsan tubes a selficient cause to disosity these cases in the Class B managh because a letter content content of the content of the content of the content of the a trackforthal by was returned with a description of the normal pregmancy and followers which occurred a year lasting.

stenosis, rendering conception very unlikely. There can be no doubt that stenosis, and even complete atresia of the cervical canal, occasionally follows amputation of the cervix. Several such cases have been reported associated with hamatometra, and we have very recently seen an example in this clinic. Should stenosis of the cervical canal occur commonly after this operation, we would expect precisely the results obtained by an analysis of the cases here reported, namely, a large percentage of sterile women and repeated pregnancies in the fertile group. The reason for this is apparent. cervical stenosis, conception is less likely, and the percentage of sterile women rises. Should pregnancy occur in spite of the stenosis, the subsequent delivery, even though premature, would probably dilate the narrowed cervical canal sufficiently to render the occurrence of a second impregnation much more likely. On the other hand, should there be no stenosis following operation, there would be, of course, nothing to interfere with repeated pregnancies.

Theoretically, it would seem likely from the results obtained that at least a narrowing of the external so commonly occurs after amputation of the certial, whether due to the healing together of the puckered edges of the vaginal culf about the external os or to subsequent ris like cicatricial contracture in the certifical summer.

Pozzi, La Torre, Morisani, and others have laid great stress upon the prevention of cervical stenosis following the operation by careful approximation of the vaginal and cervical mucosæ, in order to obtain healing per primam and thus avoid the formation of a cicatrix. Cases presenting cervical stenosis after operation, they attribute to poor operative technique Yet it is difficult to understand how a vaginal cuff of mucous membrane measuring several centimeters in dlameter can be "accurately approximated" to a cervical canal measuring but a few millimeters in diameter Raw edges of puckered vaginal mucosa are certain to be clustered about the periphery of the newly formed external os, even though the lateral angles of the vaginal cuff be turned outward (away from the canal

by special suture) a procedure which markedly diminishes this effect. When the cervix is pushed back into place and a vaginal pack introduced, it would seem very likely that in a large percentage of cases healing together of the raw edges of the vaginal mucosa about the external os would ensue, thereby diminishing its calibre. Likewise, the contraction of the cicatrix following the operation, whether healing has been by first or second intention. can be but in one direction - towards the cervical canal. Any scar tissue caused by the operation must in contracting be comparable to the action of the iris, narrowing the cervical canal much in the same way as the latter narrows the pupil

It is questionable whether these objections to the operation itself would hold if one should employ a very simple but effective procedure which Dr. Kelly has used for some time. Instead of completing the amoutation on a plane perpendicular to the long axis of the cervix, a wedge-shaped piece of tissue is removed laterally, on each side of the cervix, so that when vaginal and cervical mucosæ are approximated, a wide, smooth external os is formed, rather than the usual parrow, slitlike aperture almost hidden by the puckered edge of the vaginal mucosa about it. method is comparable to "cupping" the cervix, as practiced after a supravaginal hysterectomy, so that it may be hetter closed over. The danger of narrowing the cervical canal by the operation should be further avoided - first, by the introduction of a cervical drain of rubber or protective, to he left in place for a week or more following operation, to prevent healing of the edges of the vaginal cuff; and secondly, gentle dilatation of the cervical canal some months afterward, a procedure which could be easily accomplished without the use of an anxesthetic, and which would remedy any narrowing of the cervical canal which might have taken place

It must be admitted that the value of the operation in certain cases of persistent sterility is incontestible, yet it appears that the procedure as ordinarily performed is often the cause of that very condition. Much attention has been paid in the literature to cases

of sterility cured by the operation, while the numerous multiparæ (80 per cent) who remain sterile subsequently have been practically ignored.

5. Frequency of abortion and premature delivery following amputation of the certix. The incidence of abortion and premature delivery is admitted by practically all ob servers to be considerably increased after amputation of the cervix. Guibout, stating that abortion probably only follows an amputation improperly carried out, nevertheless admits that they occur with a frequency which is hardly negligible, while Ducasse, La Torre, and Morisani reach the same conclusion. Pescher concludes that the operation distinctly favors premature dilatation of the cervix, and agrees with Pedobedoff that the incidence of premature delivery may be increased, while Audebert and de Koninck are less conservative, declaring that the operation exercises a marked influence upon the course of subsequent pregnancies by causing very frequent abortion and premature delivery Nevertheless, Bernheim concludes, from an analysis of forty-nine cases, that abortion is not more frequent, and that when it occurs, causes other than the operation can be found.

The results obtained by an anlysis of the A cases of this series reporting pregnancy after operation are quite in harmony with the conclusions of Audebert and de Koninck. Ten of the 1x eases, or about 7x per cent, had one or more miscarriages following the operation, while 5 of the cases (56 per cent) had premature deliveries, varying from the sixth to the eighth month

to the eighta monta. We would evpect a high amputation of the cervix to increase the liability of a subsequent pregnancy to end before term. In only one of the 14 cases, was more than 3 cm of the cervix removed This case had two children afterwards, both at full term, and on miscarriages or premature deliveries, being one of the 3 cases in which each pregnancy occurring after operation went on to normal completion. In each of the other 13 cases, from 2/2 to 3 cm. of the cervix was removed, which is as high an amputation as is usually done

In order to appreciate the effect of the operation more fully in this respect, it is important to compare the marital histories of these cases before and after amputation of the cervix.

Previous to operation, these r4 cases had had a total of 52 pregnancies Twelve of these ended by miscarriage (23 per cent) and one by premature delivery (2 per cent), making a total of 25 per cent ending before term.

After operation, these same women reported a total of 32 pregnancies. One of these has not as yet terminated, so cannot now be considered Of the remaining 31 pregnancies, 11 terminated by miscarriage (351/2 per cent) and 6 by premature delivery (ro per cent), making a total of 55 per cent of the pregnancies occurring after operation prematurely interrupted, as compared with 25 per cent before operation. Similar results are obtained by Audebert, who reports 16 cases, collected mainly from Pinard's clinic Before operation, his cases had 22 deliveries at term and 5 before term After operation, these women had only 5 full-term deliveries, as compared with 19 pregnancies which ended prematurely In the following tabulation, these results show up somewhat more strikingly

COURSE OF PREGNANCY BEFORE AND AFTER AMPUTATION OF THE CERVIN

	Before operation (Audebert)	No Cases
	Delivery at term	12, of 81% 5, of 12%
	Interrupted before term	6. OT 12%
	After operation (Audebert)	
	Delivery at term	5 or 21% t9, et 79%
	Interrupted before term	10. et 10%
ţ	Before operation ([H Hosp)	***************************************
	Delivery at term	39, of 75%
	Interrupted before term	13, or 25%
	After operation (J II Hosp.)	-51576
	Delivery at term	14. OF 45%
	Interrupted before term	14, or 45%
	Now Pregnant	1

It will be noticed that, in the cases from this clinic, 25 per cent of the pregnancies before operation terminated prematurely It might be argued that the high percentage of miscarriages following the operation is due largely to the fact that these particular cases had a habit of aborting, which scents true. Evecttheless, it cannot be denied that the

operation more than doubled their proclivities in that direction. Again, the objection might be raised that some of the other operations simultaneously performed on these cases account in a measure for the large number of subsequent miscarriages. It happens that in this particular series such an objection is easily answered.

r. In 2 of the cases amputation of the cervix was the only operation done, while in 6 instances, a repair of a relaxed vaginal outlet followed

2. In 5 cases, the abdomen was opened, in each of these, a suspension of the uterus and appendectomy only was done. Every one of the five have had one or more full-term children since, although only 8 of the 14 cases had normal pregnancies. It cannot be argued, therefore, that the high percentage of miscarriages following the amputation is due to the abdominal operation. If due to the operation at all, the cervical amputation must be the cause.

The results obtained by this analysis, as well as the observations of numerous authors who have discussed the subject, conclusively prove that in the event of impregnation following this operation, the chances of a normal completion of the pregnancy are markedly diminished Advocates of the operation attribute such results, as well as any other unpleasant sequel of this procedure, to poor operative technique, but the constancy of the results obtained by so many competent operators easily disposes of such an explanation According to the cases reported above. a pregnancy occurring after amputation of the cervix has not more than an even chance of progressing to term

6 Ampitation of the cerix as a cause of subsequent dystocia. The question of the influence of amputation of the cervix upon subsequent parturition seems to have attracted more comment in the literature than any of the other numerous objections to the operation. Before the introduction of plastic methods, the cervical stump was left uncovered, to heal by granulation. The large, firm cicatrix resulting must have invariably been a cause of e-crios dystocia in the very occasional cases becoming pregnant after

such a procedure Since Sims (1861) introduced his method of covering the cervical stump with vaginal mucosa, such crude methods have been ahandoned, but the occurrence of dystocia following various plastic operations on the cerviv is, according to many authors, very common

Pinard states that "in destroying the continuity of the tissues of the cervix one invariably obtains a cicatrix This cicatricial tissue may be the cause of pathological rigidity at the time of labor " Guibout concludes that, following the operation dystocia may reach any extreme and may be the cause of death of both mother and child According to Martin, cicatricial rigidity may account for serious obstetrical mishaps, while Pedobedoff states more conservatively that dilatation of the eervix may in some cases be delayed at the time of labor. Peycher even insists that it is exceptional for the dilatation of the cervix to progress normally. On the other hand, Duponnois concludes that the operation merely renders labor shorter and ca ier, vet, to quote Tarnier and Boudin, "in these serious cases of sclerosis in which the cervix is inclusive parturition by the natural route is most dangerous," indicating the frequent necessity for Caparean section

Pozzi, La Torre, Pichevin, Doléris, Bernheim, Morisani Ducasse Chalicux-Vivie, and others attribute such results to poor operative technique Doléris even reports 78 cases (operated upon by himself) without the occurrence of dystocia in a single instance Referring to Pozzi's statement to the effect that none of the various opera tions now practiced on the cervix compromise its elasticity, de Komnek says, "This opin ion is one of evaggerated optimism" while Audebert and Guibout seem to agree with him On the one hand are cases reported by Lepage, Toledo, Martin, l'abre and many others as terminating by miscarriage, premature delivery, an obstetrical operation, or even rupture of the uterus, yet enthusiastic advocates of the operation assure us that no such unfortunate sequelæ are to be leared

Of the 14 women of this series who became pregnant after operation 11 had children at term or at the eighth month A report

from these cases on the delivery of the first child after operation shows that 7 of the 11 cases (64 per cent) experienced serious dystocia The other 4 cases had easy labors

Audebert states that, following this operation, premature rupture of the membranes is of common occurrence, while de Koninck, Guibout, and others are of the same opinion. Unfortunately, the data as regards the incidence of this complication are lacking in this

series of cases
It is evident, Irom a consideration of the
foregoing discussion, that dystocia commonly
follows, amputation of the cerviv. It is unhiely that this, as well as any of the other
objections to the operation can be adequately
explained on a basis of "imperfect operative
technique". Too many surgeons whose ability cannot be questioned have obratned such

results to admit of such an explanation. In conclusion, I wash to thank Dr. Kelly, chief of this clinic, at whose suggestion this work was undertaken and under whose direction it was completed. Also, to Dr. Wm. W. Rusell, I with to express my appreciation for many valuable suggestion.

CONCLUSIONS

In view of the results obtained by the analysis of the 128 cases reported, it may not be unreasonable to draw the following conclusions.

 Hæmorrhage after amputation of the cervix is not uncommon (5 per cent), and may occur weeks after operation

Cases of late post operative hemorrhage are due to infection rather than faulty suture of the cervix

3 After amputation of a diseased cervix, 90 per cent of the patients show noticeable improvement in general health

4 Persistent leurorrhoa of cervical origin is cuted in 60 per cent of cases and improved in 30 per cent

5 About half the cases experience less menstrual pain after the operation

6 Four fifths of the women remain sterile after operation, yet in certain selected cases of persistent sterility amputation of the cervix seems to be the only practicable proredure.

- 7. This post-operative sterility is probably mechanical in origin, and may be due either to a narrowing of the external os through encroachment by the edges of the vaginal mucosa or to a stenosis of the cervical canal, consequent upon the iris-like contraction of the cicatrix which invariably follows the operation
- 8. A pregnancy following amputation of the cervix has not more than an even chance of progressing to full term, in which event

o Serious dystocia due to cicatricial rigidity of the cervix will commonly be encountered

10. Amputation of the cervax is the opera tion of choice in elderly women, but the procedure should be applied to those in the child bearing period only when more conservative methods of treatment, such as Hunner's linear cauterization or thorough curettage of the cervix, have failed

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PRIMARY TRAUMATIC DORSAL COMPLETE RADIOCARPAL DISLOCATION

WITH REPORT OF A CASE

BY A MERRILL MILLER, M. D. DAVIELE, ILLINOIS

Allis luration is rare. Its marked infrequency is the principal reason for its presentation The leterature shows there are fewer than forty authentic This list is growing slowly. Considering the completeness of records in most of our large hospitals, and the light shed upon doubtful bone lesions of the wrist by the

Rontgen ray, one must admit the list is not large

The absence of a uniform classification compels us to admit to the bibliography certain articles having to do with the wrist joint, e.g., luxations of the wrist, dislocation of the radius, and carpal displacements may contain references to the lesion in question. But, from title alone, all do not specify backward displacement, and this fact may be given a minor part in the report Even at the risk of criticism, all references are included which might in any way contribute to the subject Classifications always vary with the personal view of the author and current surgical usage. Reports are often scant in detail as to anatomical location, the complication of

fractures, or break in the integument. Any attempt to classify other than along the broadest lines may omit reports germane to the subject Many texts give a mere outline without comments. At hest the discussion is brief

Considerable doubt was formerly expressed concerning even the existence of this lesion, un til accumulated clinical evidence was corrob orated by the X-ray Conscientious and wellinformed surgeons took different views and exhibited much spirit in their support. \ very vigorous dissenter was no less an authority than Dupuytren (28), who said. "I had always found these supposed dislocations of the wrist turn out to be fractures, and in spite of all which has been said upon the subject. I have never met with or heard of one single well-authenticated, convincing case of the dislocation in question." Certainly a clear-cut statement which leaves no doubt as to his individual opinion Dupuytren, however, was denied the ocular proof of exactness furnished by the X-ray. With such teachers and surgeons as Smith, Nelaton, and Cooper

Read before the Azculapun Society of the Wahath Valley, Terre House, Indiana, May 36 unto Town awaited by Dr Carl H Von Klein Chicago in looking up the literature and believen by

clinical observation and deduction had reached a high degree of excellence; but after all an individual opinion could not be checked by any final and conclusive method of examination. Reports do not state in every instance that the dislocation was dorsal, on the other hand, they omit saying it is not.

The age at which dorsal dislocation occurs is strikingly in favor of young male adults. From the list of cases it is evident they occur in those mostly exposed to acute traumatic injuries. Schroeter (59), reviewing the traumatic luxations of the wrist, says, "Luxations occur mostly in children where anatomical conditions are most favorable." In only one case in which the age is recorded is this injury found above thirty years - report made by von Brunn (11) From the nature of the injury and character of the displacement, the lesion must be one due to a severe, usually quick, traumatism The screw-like action in cases reported by Rydygier (57) and Cameron (14), in which the elbow was in a fixed position against a solid wall with a dorsally flexed hand against a moving wagon, affords an opportunity to study in detail one mechanism of displacement.

While by far the majority of dorsal dislocations oscur without a break in the integument, numerous instances are recorded— Chassaignac (17), Couteaud (22), Hecht (35), Korte (41)—in which a protrusion of the arm or wrist bones took place This compound injury is often followed by an in fection in either bone or synovial membrane, with a corresponding tardiness in recovery

Before the advent of the X-ray, wrist tesions of all varieties were recognized only by clinical signs, with the exception of a few cases in which post-mortem examination (61, 67), or operation (17, 20, 23, 27, 22), confirmed the diagnosis. Those in which resection was necessary should be cautiously admitted under this classification. A radiograph in addition to the history is necessary to make the diagnosis positive, and removes at once all doubt as to the condition present

The lesions likely to be met and excluded are: (a) Barton's fracture; (b) separation of the radial epiphysis (17); (c) luxation of the carpus; (d) the carpus upon the meta-

carpal bones; (e) Colles' fracture. Dorsal tuxation bears but a superficial resemblance to this fracture, and if one keeps in mind the styloid processes confusion should not occur. This displacement offers little difficulty of diagnosis, is simple in reduction, and satisfactory in results

The manner of production is not uniform, except it is due to direct violence. Authors give contradictory causes as producing the same deformity. Case reports of dorsal dislocations in which the hand was bent dorsally have been made by Bays (5), Cooper (18), Hecht (35), Moriarity (51), Delorme (24), Given (3r), Korte (42), Couteaud, and Rydygier (57). Exactly the same lesion has been reported due to volar flexion by von Brunn (11), Sir Astley Cooper (18), and Roland (56). Wyeth (68) recognizes this but cites no cases Cotton (19) says, "That falls upon the back of the hand should cause is hard to understand." From this evidence we must not conclude that it has a single cause

Mechanically, it seems to me, the most avorable position for backward displacement obtains when the hand is dorsally flexed and the fingers are partially contracted, claw-like Given these conditions, the volar tendons act as a skid and elevate the carpus out of the radial socket Spasmodic contraction of the forcorm muscles maintains the deformity. Without fracture, crepitus is absent.

Dorsally the articular surface of the carpus is palpated just under the integument and proximal to the styloid processes of radius and alian. These landmarks are found in their proper relative position under tightly drawn skin, and are continuous with the shafts of their respective bones. This essential point in differential diagnosis is readily determined. The rounded carpus, as well as the concave articular surface of the radius, is somewhat masked by tightly stretched tendons.

Again, Juxation is exactly at the radiocarpal joint. The prominence is abrupt. The deformity is angular. It is strongly marked, and greater than in other injuries in this region. Swelling and hemortrage are absent. Hæmorrhage not only means bleeding between the bone fragments, but into the neighboring structures as well. The hand is on a plane parallel with, but posterior to, the forearm. This position of the hand must raise the dursal tendons from their attachment to the radius The fingers assume a position of demifferion Anteriorly, the value ligament is contouredthe lateral as well (12)

Almost without a dissenting planse clinicians and writers are agreed that simple dorsal dislocation is readily reduced with or without anasthesia, by traction and pressure upon the carous. The hones tend to assume their normal relation when muscular spasm has been overcome Difficulty in reduction should excite suspicion of some complication or error in diagnosis. When replacement has been made, there is but little tendency to recurrence unless the luxation is nartial. This security is due to the character of this rount and the strong natural splints in the tendons. Of some comfort, both to surgeon and patient, I tend no instance mentioned of permanent disability to the wrist

REPORT OF A CASE

History On August 19 toto a soung mak adult f' W M age 41, while attempting to start the mutor of a large automobile fall a suckin sharp pain in the regum of the right wrist. The operator was mushing down upon the starting reank which was about horizont il center. The line of resistance nas against the palm when the flexors were partially contracted the hand being slightly flexed dorsalls the direction of forie against the palm being similar to a fall upon the outstretched ham! The wrest was a fixed point, the jirlm ilistally being movable offered uleal conditions for dorsal luxation of the carpus

Lagranation Superficially it resembled a Colles' By more careful inspection the carpus was found to overrule the dorval aspect of the radius. Measure ments from the prominent lumit (the carpus) posteriorly to the cail of the muldle larger were ex actly the same as in the normal hand \M passive movements painful Styloul process of both railius and ulna normally located Creptus absent Reduction under ether by slight traction upon the hand and pressure over the timot No tendency to become displaced Light fixation whim

X-ray examination Taken fifteen hours after the injury, and shows all bones in their normal relation; also a fissure fracture extending one thinl was across the rulius from the medial sale Stylont unicess intact

Passive motion given at intervals until the fourteenth day, when all dressings were removed Good result

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THE PROGNOSTIC VALUE OF THE LEUCOCYTE COUNT IN PELVIC SUPPURATIVE CONDITIONS

> BY JOSEPH I SMITH, JR., M D., CLEVELAND Demonstrator in Gynecology Western Reserve University

OME time ago, a patient was admitted to Lakeside Hospital presenting definite indications of bilateral purulent salpingitis Yet this woman did not appear very ill, her pain was not severe, there was no distention; the temperature, which after admission had never been above 00 8° Γ., was quite normal before operation Her pulse and her general conditions were practically normal. Nevertheless she presented a leucocytosis of about 16,000, and this fact rather worned us. We were still more worried when, after operation, she developed a generalized peritonitis, with a temperature of 104.8° F. and a pulse running up to 176 Prompt drainage was instituted, and she got well, but this experience, combined with others of a similar if less striking nature, has led us to dread operations upon suppurative cases which present high leucocyte counts. even when unaccompanied by severe clinical symptoms.

Such experiences causes us to inquire somewhat more closely into the relation of preoperative leucocytosis to post-operative recovery. It is, of course, generally conceded that, in a rough sort of way, a relatively high, as opposed to a low, count indicates the presence of pus, a poorer walling-off, a more virulent organism, or a more acute stage of the disease The question for solution is, whether this higher count can be utilized in estimating heforehand the nossibilities of the spreading of the infection after the operation. Is the degree of leucocytosis, as an indication of the gravity of a given case, to be put on a par with the temperature, the pulse, and the general clinical symptoms? And when these various factors disagree, is it were to be influenced by the leucocytosis more, or less, than by the fever and other signs and symptoms? In the text books, no satisfactory answers to these questions are to be found all state that a high count indicates pus, but the general opinion scens to be that the count in pelvic cases is quite variable -- that large amounts of pus may occur with quite low counts, while little or no pus may be found in cases in which the leucocytes are most numerous The books generally state that the leucocytosis is largely controlled by factors which we cannot accurately measure, such as the sterihty or virulence of the pus, the completeness of the walling-off, the nature of the organism involved, and the opsonic index of the patient's blood. Without more exact knowledge of these points (they say) it is impossible to estimate correctly the value of the leucocyte count obtained, and the implication is that the count itself is of little value in such pelvic suppurative condi-

The questions I propose are leucocytes themselves a measure of the viru lence, the walling-off, etc.?" "If so, do they offer a good method of measuring the very factors which determine why one patient gets well with rapidity and ease after her operation, whereas another has a very tedious or even precarious convalescence?"

"Are the

In endeavoring to arrive at a solution of

these problems, one hundred cases have been tabulated from the records of Dr. Robb's service at the Lakeside Hospital. These cases were taken absolutely at random: a certain number of volumes of the histories were taken haphazard, and all the suppurative cases recorded in those volumes were abstracted. In order to eliminate as far as possible the personal element in the leucocyte counting. volumes of the histories were taken with dates as widely separated as possible, so that the counts of many different house surgeons might be included Otherwise, there was absolutely no selection of cases. All pelvic pus cases, which later were submitted to a laparotomy and in which a preoperative leueocyte count was recorded upon admission, were thus

tabulated, up to a total of one hundred cases It may, of course, be objected that accurate results cannot be obtained by thus throwing together a number of widely different supnurative conditions - that, for example, it is impossible to compare a simple gonococcus pyo-alpingitis with a big streptococcus abscess following an injected labor. But the point is that frequently a preoperative diagno is as to etiology and the extent of the disease is impossible, and we are taking all these cases together, to see if the leucocytes can belo us in the many instances in which the other prognostic facts are lacking or incom-For that reason, we have tabulated chiefly those facts that can always be learned about any patient - temperature, pulse, somiting, and the like; and upon such facts we base this comparison

To those interested in the leucocytosis in er necological cases, the inaugural dissertation of Otto Pankow, Jena, 1904, is of special interest In Dr Pankow's group of pelvic pus cases, however, the counts ran much lower than ours at Lakeside, only few of his cases presenting a leucocytosis above 9,000 Apparently, I may add, all his patients recovered uneventiully

Regretting the necessity of presenting to you tables of dry figures, I have tried to make them as short as possible; and so we have been forced to divide the cases into groups of

all might mention that it is our practice to de'er operation in such cases tall the armie stage has passed

"high" leucocyte counts and "low" leucocyte counts; "high" fever and "low" fever, etc-The figures shown as the dividing lines between these groups of "high" and "low" may seem to be picked rather arbitrarily, but they are as near the fair mean as possible

The numerical average of all the hundred leucocyte counts was 16,200 The highest count was 38,000; the lowest, 5,700 14.000 divides all the cases into two roughly equal groups, it was chosen as a standard. Thus a "high" leucocyte count means one of 14,000 or over; while a "low" count is one below that figure. Similarly, a temperature of 101° F. or over is called "high" for the purposes of this tabulation. A pulse above 120 at any time after the effects of the anæsthetic were over is also referred to as "high."

Let us, therefore, consider all the cases which, on admission, had counts of 14,000 or over, and contrast them with those showing less than 14,000 leucocytes The group of "high" counts includes 53 cases, that of the "low" counts, 47. The percentages mentioned, of course, belong to the particular group referred to, not to the whole hundred cases.

	14 000 04	Low-
faximum temperature above 101° F		
after operation in	75%	40% 34%
faximum pulse over 120	66%	34%
ebrile more than to days	81%	23%
Mortality, exclusive of deaths of	1	
table	11%	0%
Drainage required in	45%	15%

Let us now contrast, in a similar manner. the group of cases which presented both a high leucocyte count and a high fever with the group of cases in which both temperature and white cells were low There were 24 cases in the former group, and 33 in the latter.

High—Fever Low—Frver
Lot' or over, below 101",
legocytes Eurocytes
14,000 or over below 14 000

lor F.		
Post-operative pulse above 120	75%	40%
Febrile more than 10 days	71%	25%
Mortality.	7979	129
Declary.	16%	0%
Drainage required.	30%	6%
There Commende		- 1

These figures are just about what one might have expected, but the important comparison comes in regard to the groups in which the

leucocyte count and the fever do not tell the same story. When we first see our patient and find a high leucocyte count combined with a low fever, or vice versa, upon which finding can we place the greater dependence in making our prognosis? Thus we take two groups: -In the first -- which includes patients with leucocytes over 14,000 at admission, but with a temperature constantly below 101° F, previous to operation - we find a total of 27 cases. The other group embraces 16 cases, in which a leucocytosis of less than 14,000 was combined f---- that went above you F before

with a fever that went ab	ove tor.	r. perore
the operation	High Leu-	Low - Lou-
· ·	good and over.	cocytes be
	fever below	levet tor o
Post operative temperature over 10	1° 81%	42%
Post-operative pulse over 120	67%	48%
Februe more than to days	93%	36%
Mortality	8%	6%
Dramage required	44%	42%

These figures are certainly suggestive, Certain other facts are interesting also. Serious complications developed in seven of our hundred cases. These included general peritonitis, broncho-pneumonia, suppuration of the incision, and acute pericarditis. these seven patients, only two had a preoperative temperature of more than ror F .: whereas, with but a single exception, they all showed a leucocytosis above 14,000 Four patients required secondary operations for the evacuation of septic fluid Two of these four had preoperative temperatures below 100° F., but the leucocyte counts ranged from 15,000 to 36,600 upon admission.

One other comparison might be of interest - that of the outcome of the ten cases showing the highest white counts, as contrasted with the ten cases showing the highest preoperative fevers The high white counts range from 28,000 to 36,000; while the high fever ranges from 102.5° F. to 104° F.

Average preoperative leucocytes. Average preoperative temperative	Ten highest leucocyte counts 32,500 ture	Ten bigh levers 16,630
Average highest post-operative t	****	103
perature	****	102
Average highest post-operative p		132
Average days febrile . Percentage mortality	28	14
Percentage required drainage	. 50	20
a commer sedented disipage	- 80	50

A word about the mortality. Six of our hundred patients died. Three died of general peritonitis, in from five to tight days after operation. Two died of general espiteania, na 28 and 34 days respectively. One died of pyamia. The preoperative temperatures ranged from 99° 1, to 103° 1, but the lowest kuccos te count in our fatal cases was 19,000, the others ranging from 20,000 to 13,600 upon admission.

Leaving aside, for the time, our series of one hundred cases, I find that a total of ten deaths have occurred in Dr Robb's service following laparotomies for petric suppurative conditions, in which an admission white count is recorded. The preoperative maximum temperatures ranged from og P 1 yo only so per cent being above ror 1 On the other hand, but two white counts were below 19,000 on admission. Of these two patients, one died of shock upon the table, and so does not come into our account; the other, with a count of

11,000 died of general epticamia after 23 days, so that only 10 per cent of the fatal cases showed a low count.

CONCLUSIONS

The leucocy te counts in pelvic suppurative conditions are extremely variable.

2 In a series of 100 such cases, the leuco cyte counts were decidedly of more prognostic value than the preoperative temperatures.

3 With pus in the pelvis and a lencocytosis above 14 000, some trouble arose during the convalescence in a majority of our 100 Cases.

4 With pus in the pelvis and a white count of less than 14,000, trouble developed during the convalescence in only a small minority of our too cases.

I wish to express my indebtedness to Dr. Robb for his kind permission to use the records of his service at the Lakeside Hospital, and also for his interest and help in this work

GOITER AND ITS RELATION TO ITS STRUCTURAL AND PHYSI-OLOGICAL UNITS:

BY WILLIAM CARPENTER MACCARTY, M.D. ROUBENTE MINNENUTA Laborator of Surgical Parisology of Mary's II speak Mayo Choic

TAIL evolution of our knowledge of the subject of gotter may be briefly stated to have begun with the recognition of four clinical facts, i. e., the presence of a tumor of the thyroid gland; the presence ol a condition called myxerdema, which was found in association with changes in the gland, a condition known as cretinism, which was associated with thyroid changes, and a clinical complex in association with protrusion of the eyes and enlargement of the gland. Clinicians, surgeons, chemists, hygienists, pathologists, physiologists, embryologists, and zoologists have endeavored, disconnectedly, to understand the conditions and their etiology.

Experimental surgical experience may be briefly summarized from the beginning of the unsatisfactory efforts of Schiff (1884) at tran-plantation of thyrotel tissue after thyroidectom; Bircher (1800) tried the effect of transplanting thyroid tissue into a myxordematous patient His efforts were followed by good but not perfect results. Horsley (1890) transplanted the thyroids of monkeys and sheep without striking results. The imperfect results of these experiments were considered to be due probably to the method of transplantation Von Eiselsberg, therefore, acting upon this supposition, transplanted the thyroid into the abdominal wall of thyroidectomized animals. His work led him to say that further work would be necessary before definite conclusions could be made. Payr (1906) transplanted the thyroid into the spicen in thy roidectomized animals without great practical results. Other experimenters have repeated these experiments

1 Read before the Chicago Madeal Society October 30, 1911

with results which merely demonstrate the essential nature of the organ to animal economy and the relative value of transplantation to therapy.

Partial thyroidectomy in goiter in the hands of Kocher, Mayo, Halstead, Crile, and others has given sufficient empirical satisfaction in the human being to demonstrate its necessity in the treatment of the clinical conditions, which have not responded to any known

hygienic, medical, or serum treatment A knowledge of the chemical nature and the supposed active principles of the thyroid extends back to a period several years before animal experimentation upon the thyroid came into use The iodine content of the thyroid was known to Oldtmann (1858), and the water supply of regions of endemic goiter and cretinism were studied by Chatin (1850). The work of Baumann (1806), however, demonstrated that iodine was a normal constituent of the thyroid and was present in larger proportions than in other organs of the body. From his work detailed studies have developed upon this constant constituent with the discovery of its incorporation with protein cellular constituents. The iodized proteid was given the name "iodothyrin" or "iodotbyro-globulin" The essential nature of the gland and the chemical findings gave rise to speculation, which led to various theories, namely, the "secretion theory" (Baumann, Ross, Oswald, and others), the "neutralization theory" (Notkin and Blum), and the "biological reversion theory" (MacCarty)

The whole experimental work which has been done upon the thyroid, especially the work upon extirpation and transplantation, has apparently demonstrated the essential nature of the organ to economy It has led to the use of thyroid extract with effective results in cases of apparent thyroid insufficiency. It has led the surgeon to more accurate surgical procedure, and has enabled him to empirically cure many patients and relieve many others Hygienists and clinicians have advised change of drinking water and environment, meat-free diet, rest, iodine, belladonna, and special sera, with the result that no recognized specific is apparently known, at least not practiced.

The pathologist has been willing to classify the conditions into types by means of a terminology, which is indefinite, semi-clinical, undescriptive, and extremely varied Zoologists, embryologists, and physiologists have not had the economic importance of the condition impressed upon them sufficiently to make them devote large amounts of energy and time to the evolution of the organ and its normal function

After an extensive review of the literature upon the subject and in the presence of accepted facts, namely, that the function of the thyroid is unknown, the ctiology of pathologic conditions in and associated with the thyroid is unknown; that therapeusis of gotter, as practiced, is empirical; that clinical pictures and pathologic terminology are confusing, and that the condition is of economic importance, the most important question which arises is, in the writer's opinion, simply; what are the actual anatomico-pathologic conditions which are found in the thyroid gland?

This question may seem superfluous, indeed academic, in the presence of the extensive descriptions in journals and text-books. The writer's experience, however, with over three thousand freels specimens, which were removed at operation, prompts a confession of inability to group his material into and according to the published classifications and terminology which have been thus far presented

Pathological diagnoses which are dictated by clinical diagnoses are easily made. Diagnoses such as "colloid goiter," "exophthalmic goiter," and "foetal adenoma" are very simple, but they are much simpler than the conditions which are actually present. If, however, progress is to be made in scientific medicine, independent observations must be made by the pathologist, who is uninfluenced by clinical dictation. It is his duty as a scientist, in conditions as chaotic as the subject of goiter, to record what be sees and not to make diagnoses. Correlation may be made after sufficient embryological, anatomical, zoological, clinical, chemical, and therapeutic data are obtained. With this independent attitude toward pathologic con408 SYMMETRICAL OR THYROID SHAPED THYROIDS OR GOITERS Descriptiva diagnosis undifferen-tiatad fortal admonta 0 --- -Bistological unit Descriptive diagnosis fortal thyrost Shape the rood share Hetological un or thyroid thops Hetologyal und thyroid mmetrical or thyread shape Hetalogical Wests Descriptive diagnosis hypertes plus collored thyroid or gotter thape sommetrical or thyroid Descriptive diagnosis by pert phic paret Shape thatory spate byroid or goden

ditions, it has been found that the material which has been removed in St Mary's Hospital has presented the following facts.

The specimens themselves, as they came immediately from the patient, formed two large groups, namely, the symmetrical or thyroid shaped group (Fig 1) and the asymmetrical or nodular group (Fig 2) grouping has absolutely no apparent direct relation to the activity of the gland. It is merely the result of the structural arrangement of the glandular units and their supporting structures Analysis in the mechanical sense results in the realization that any gland is a system which is composed of units

The fætal thyroid is symmetrical or thyroid shape, and is composed of histological units, formed of groups of four to six epithelial cells. which are arranged to form an acinus An acinar lumen is rarely seen in the fætal thy-This type of acinus constitutes, physiologically and histologically, the differentiated thyroid, and differs from the normal adult thyroid only in size and the absence of an acinar fumen

The post-natal thyroid is symmetrical, and is composed of acini or glandular units, which have lumina surrounded by low cuboidal cells. The lumina are filled with a so-called "colloid" substance All acini of such a thyroid are not of the same size although the variation is within small limits. One not infrequently finds a thyroid which has the microscopic appearance of an adult normal thyroid (B) The acini, however, vary in histological characteristics from that of the foetal thyroid (A), to and including the acini of the normal adult thyroid (B) The thyroid may be described as a post natal "normal" and

feetal thyroid (C) The three conditions (feetal thyroid, normal thyroid, and post-natal normal and feetal thyroid) just described may be considered "normal" in the light of our present knowledge, although the fact that all the surrounding glandular tissue of adenomata resembles the condition which is seen in the post-natal "normal and feetal thyroid" may serve as a guide to prove the origin of adenomata in embryonic irregularities in differentiation or reaction to normal stimuli

ASIMMETRICAL OR NODULAR THYROIDS OR GOITERS

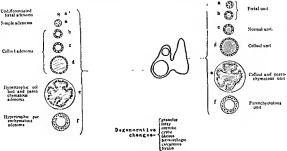


Fig 2.

The symmetrically hypertrophic thyroid, which is seen by the surgeon as goiter, presents definite macroscopic and microscopic pictures, which may be grouped under four headings. This grouping may be done purely upon a histological basis.

The simplest hypertrophic thyroid, hypertrophic colloid thyroid (D), consists of acini, which are larger than one finds in the "normal" thyroid. They are readily visible grossly and contain glistening colloid. The condition is apparently a diffuse or general reaction to some stimulus Such thyroids have been removed in cases with a symptom complex which has been clinically taken to be mild "hyperthyroidism." In most of such cases some small amount of hypertrophic and hyperplastic cells are often found This gland corresponds to the condition which Marine has called the cured gland, the condition which occurs experimentally after the administration of iodine. Whether such a specimen has passed through the histological picture of marked epithelial hyperplasia is impossible to determine with our present material and methods. It leads up to and is not definitely marked off from the third hypertrophic gland in the diagram, i. e., hypertrophic colloid and parenchymatous thyroid (F)

Before considering this combination gland, however, the hypertrophic parenchymatons gland (E) should be described. Grossly it is a meaty symmetrical thyroid. Histologically one deals with an achus which varies in size but which is usually small, more often about the size of the normal achus, but which is composed of hypertrophic or hyperplastic cells, which surround a lumen which is usually not filled with "colloid" material. The fourth hypertrophic symmetrical thyroid is composed of acini (a, b, c, d, e, f) which are represented in all of the foregoing thyroids. Such a specimen may be descriptively called a hypertrophic, fatal, colloid, parenchymatous throid (G).

All the pathologic conditions of the gland which come under the heading of goiter do not allow the gland to retain its original shape. Asymmetrical or nodular glands, which compise the second group (Fig. 2), contain usually, if not always, one or more encapsulated oval or round adenomata. These vary greatly in size and number. They may be milli-

meters or centimeters in diameter; they may be single or there may be so many present that the gland becomes a nodular mass.

The capsule of adenomata is fibrous connective tissue, which varies greatly in thickness and density. It is frequently calcareous. The body of the tumor upon gross section is variable The cut surface of the simplest undegenerated tumor is firm, uniform, and free from macroscopically visible colloid. The acini of such a tumor are fortal in type (Fig 1, a: Fig 2, a), although they may contain a very small lumen (Fig. 2, b). The acini are more widely separated by a delicate interacinar stroma than in the feetal thyroid. Upon the cut surface one readily recognizes that one does not always find the simple adenomata which have just been described; colloid material is frequently seen in large amounts, the colloid containing acini are easily grossly visible Upon microscopic examination the acini are found to be large, bined with flat cuboidal cells, and filled with colloid (Fig 2, c, d). The colloid acini are indistinguishable from those found in symmetrical thyroids, described above If one searches such a tumor, feetal acini are certain to be found Acini composed of hypertrophic cells are occasionally found (Fig 2, c, f).

Red, hrown, or old yellowish hermorrhagic areas are often found in these tumos. Areas of dense and even calcareous tissue are also frequent. Many tumors are found in which a part or all of the tissue within the capsule has become liquefied. The contents of such a degenerated cyst are of amber color or luxmorrhagic. They practically always contain cholesterin crystals.

The surrounding gland in which these tumors are present presents the same acinar characteristics which have been described above for the symmetrical thyroids. In the majority of specimens the surrounding gland is of the colloid and featal type The acini do, however, sometimes present a picture of pressure atrophy, which is not seen usually in a symmetrical thyroid which is not complicaed by neoplasms. One may describe adenomata of the thyroid according to the descriptive key given below

In spite of these anatomical facts and the excellent chemical, surgical, chinical, and pathological research, which has given us a much clearer idea of goiter, very little is known about the etiology, or indeed the physiology, of the gland itself. New paths of research should be utilized in conjunction with the research which has already been done.

Not until gastric juices had been obtained by means of a fistula were we able to obtain the slightest conception of gastric secretion. Not until then were we able to study the properties of gastric juice and the action of stimuli upon its production Not until we were able to collect salvar from the salivary ducts were we able to study the chemical and physical properties of its active principle and to control its production by stimulation. These facts are so clear that they make us fear that the truth about the thyroid is far distant

The field, however, should not be a discouraging one Indeed it is filled with the greatest and broadest interest and possibilities, because it involves something more than experimental surgery and chemistry. It involves, first of all, the discovery of an experimental animal with a patent thyroid duet from which secretion may be obtained. This is the work of a zoologist or zoological physiologist, and his attention should be drawn to its broad experimental interest and practical significance.

Somewhere in the animal kingdom there is probably a thyroid which functionates nor-

Granular Fatty Condificentiated fortal Sample Condificentiated fortal Condificentiated fortal
--

mally with a patent duct or analogous organ Whether this animal is aquatic, terrestrial, or both is, so far as the writer knows, still undetermined.

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ABDERHALDEN'S BIOLOGICAL TEST FOR PREGNANCY 1

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AND

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THIS test is based on the assumption that a protein that is foreign to the blood will cause the development in the body fluids of an enzyme capable of splitting such foreign protein. In pregnancy, according to Abderhalden's observations, the placenta causes the appearance in the mother's blood of such foreign protein and, indeed, as has been shown by Veit, Schmorl and Weichard, chorionic cells may occur in the maternal circulation The fer ment having the power to destroy such placenta protein can be demonstrated by allowing a small amount of scrum to remain in contact with peptone prepared from placenta or with a preparation of the boiled placenta itself By the first method, the changes in the optical characteristics of the fluid, due to the transformation of peptone into amino-acids, are recognized by the polariscope; by the second method, the transformation of the protein of boiled placenta into peptone or amino-acids is recognized after dialysis by certain color reactions applied to the dialysate.

The first or optical method presents difficulties which detract from the use of the test as a ready clinical method, the method of preparing the placenta peptone is time consuming, difficult and not always successful; a special, and therefore expensive, type of polariscope is needed, and except in expert hands the readings are difficult. This work was begun with the intention of using the optical method, but as so many difficulties were encountered in its use as a clinical method, it was abandoned temporarily in favor of the dialysis method. The latter, with the use of the biuret test, as first announced, also has its difficulties, which, as will be shown, are due mainly to the unreliability of color reactions and the uncertain personal equation in the reading of the same. The dialysis method promises, however, to be the simpler and the more satisfactory, and therefore, with a proper color reaction, possible of universal use. Recently Abderhalden has recommended in a supplementary publication the use of a new color test, dependent on the use of triketohydrindenhydrat (Ninhydrin), and this we

From the John Herr Musser Department of Research Medicine, University of Prepartivals, and the Obstetrical Service of the Hospital of the University of Pennsylvania aided by a grant from the Committee on Scientific Investigation of the American Medical Association

have found to give more exact results than does the biuret.

METHORS

Briefly, the technique as recommended by Abderhalden is as follows:

Preparation of the placents. 'The fresh placents. after the removal of the membranes and cord, is cut into pieces the size of a quarter. These are placed in a dish and washed with running water to remove as much blood as possible. The placenta is then placed in 2 litres of water to which 2 drops of acetic acid have been added and is boiled for one minute. This water is then decanted or filtered and the coagulated pieces of placenta are again placed in water containing acetic acid and boiled again for five minutes. The water is tested for the hinrel reaction (to to ce of water aid 5 ce of 33 per cent NaOH, shake well and stratily with a o 4 per rent CuSO solution) The reaction should be arguing. that is free of all soluble protein, if all the instructions are properly carried out. If the reaction is positive the water must be changed again. After a negative reaction has been obtained, chloroform and toluol are added to the water and placents and the mixture is transferred to a wide-necked bottle well stoppered This material will keep indefinitely

Preparation of serum. The serum is obtained by venous puncture in the usual manner under asspite precaution. It must be alsolutely free from hemoglobin. Abderhalden states that 2 or 1 cc are sufficient, but in this investigation it has been found advisable, for the purpose of allequate control

tests, to have at least 5 or 6 cc Dialyris The diffusion membranes of Schleicher and Schull are the most satisfactory 'Ill membranes should hist be tested as to the impermeability of each to egg albumen or blood serum, and their permeability (by using o 1 per cent Witte's peptone) in peptones This is very important. In such a tested membrane place about 1 gm of the nnels divided coagulated placenta tissue To this add 113 to a cc of serum. Wash the outside of the diffu sion membrane with water to make sure it contains no particle of placenta tessue or blood grum. Place the membrane in a small betker containing 20 cc ol water. The level of the liquid outside the mem brane should be about the same as of that insole Cover both with toluol and keep at a temperature of 37° C for 16 to 24 hours Control tests with serum alone and with placents alone should always be

Color reactions I is the burset seat is to be used a portion (10 cc) of the drily-site explained in a test tube, and 5 cc sodium hydric (33 per cent) is added and a layer of 0.4 per cent cupins sulphus carefully superimposed. A volor to violer-purple ring indicates a positive reaction.

If the trikethydrindenhydrat test is employed.

the following steps are necessary. Take 10 cc of the dialysate (avoid including tolud) and add 0 2 cc of 2 1 per cent watery solution of triketohydrinden hydrat, heat quickly, and boil for exactly one minute. If the reaction is negative the solution remains colorless or turns light yellow. In a positive reaction a deep blue color appears immediately, or sometimes only after standing awhile

As this work was started immediately after Abderhalden's first communication, we have followed his improvements in technique as they appeared, thus using first fish-skin membrane sacks and the bruret reaction, later the Schleicher and Schull diffusion shells and the biuret reaction and finally the triketohydrindenindrat color test. The difficulties which were encountered in the earlier work were so many and so great that it seems worth while, in view of the fact that others may have encountered them to present them in some detail This is done adviseilly, for several times our difficulties were such as to succest the advisability of irropping the work entirely, but now that the technique has been mastered it may be well to state the difficulties and the

measures necessary to overcome them In the first few experiments following Abderhalden - original method fish skin membranes were used as diffusion sacks the outset of a large number examined only a few were found which and not leak after immersion in water for a few hours, many others were found to be leaking at the end of the 24 hours necessary for the test A small number, however, survived the preliminary tests with o a per cent peptone sedution and normal serum respectively, and such were used in a small number of tests with sera from four women in the eighth and minth months of pregnancy. in these the bouret reaction was used consistent results could be obtained and the tisk skin membranes were therefore abandoned and Sublember and Schull diffusion shells used rustead. At first the larger and thicker shills (No 579 35 mm in diameter) were employed, but as they proved unsatisfactors the thinner shells (No 370, 16 mm, in diameter) were substituted The smaller shells are more easily handled in that smaller containers may be used

After testing these shells against peptone and normal blood serum the work was continued with the hiuret reaction as an indica-

About so per sens were foun I permeable to serum proteins.

tor. At first the time of incubation was 16 to 18 hours, but following a later technique published by Abderhalden the time was extended to 24 hours. The results follow:

TABLE I -DIALYSIS METHOD WITH BIURET REACTION											
No.	Month of Pregnancy	Cerum!	Serum plus Ma centa	Pfs cenia	łq Dst	Peptone 0 I per cent					
-,	Eighth	_	+	_		+					
- ;	Ninth	-	1 4	١ -	1 - '	i ÷					
- : :	Seventh	171111111111111111111111111111111111111	+++++22:2:2+:++++:2:=	1111111111111111111111111	=	+++++++++++++++++++++++++++++++++++++++					
3 4 5 6 7 8	Nmth	-	i i	- 1	-	l +					
- 31	Suxth	-	i	-	t –] +					
6.1	Ninth	-	+,	i –		+					
,	Seventh	-	+,	I -		+					
8	Eighth	-	-	I -	l –	+					
10	Seventh	-	+?	۱ -	i -	1 +					
10	Nuth	-	L -	J -	J -	J +					
11	Eighth	-	1 +,	1 -	1 -	١ +					
	Smth	+	+	ι -		+					
13	Ninth	-	-	1 ~	-	! +					
14	Eighth	+	} +	ı -		+					
15 10 17	Seventh	+	+	-	- 1	1 *					
10	Eighth		1 7	1 -		1 *					
17	Ninth	+	1 *	1 +	1 -	1 1					
18	Day of delivery	-	+	1 7	=	1 :					
10	Day of delivery	1 -	1 5		ı -	1 7					
10	Day of delivery	-	1 4.	1 75		1 7					
#1	Day or delivery	_	, -	1 7	-	1 7					
#3	Delivery T day post	-	ı -	**	ı -	1 *					
3.3	Darturs	1 -	1 -		I -	1 .					
74	Toramia sixth	4.5	1 7	1 =	-	1:					
25	Eclampsia.	7	1 -	ı	1 -	1 '					
23	aeventh	+>	1 _	+>	I -	i .					
16	4 days post				i	i .					
	partum		+>	I -	١						
#7	S days port	1	١.	١.	1	1 '					
	bartum	II -) -	j -	J -	1 +					
18	Not preenant	4	+3	I -	- 1	1					
20	of prernant	+?	1 +	I -	-	1 +					
10		-	£ -	1 -	-	4					
1.1	ot prement	i -	1	Ī	=	1 -					
31	ot pregnant	1 -	I -	I -	1 -	+					

*(+) indicates positive resetion (+?) a doubtful selection (+) a perative reaction

These results were again unsatisfactory and not in accord with those obtained by Abderhalden. It was evident that the trouble could not be with the diffusion shells, these behaved properly in the preliminary tests with peptone and serum Special attention was given therefore to other possibilities of error.

It had been noticed that in some dialysates, which gave unexpected results, a cloudiness was present Microscopical examination showed that such dialysates - always fluids from which the toluol had completely evaporated - were swarming with bacteria.

This discovery led to greater care in the use of toluol, of which it was found necessary to add at least 1 cc. both within and without the sac in order that some might remain after the 24 hours' incubation. Also greater attention

was given to the cleaning of the glassware, both as regards bacteria and attached protein. It was washed successively in strong acid, alkali, alcohol, ether, and distilled water, and sterilized by dry heat. The distilled water was sterilized, and the diffusion shells before each test were placed in water which was heated to the boiling point. Likewise, the possibility of error in the preparation of the placenta was eliminated. Still the results were not uniform

This experience, with the control of all other possible errors, led to the conclusion that our trouble was due to the personal equation in the reading of the biuret reaction. Of the correctness of this conclusion we were convinced when, on several occasions, with properly prepared tests and their controls, no agreement in readings could be obtained among four or five persons accustomed to colorimetric readings

In all these readings it was never a question of a purple or purple-violet ring, but always of the slight changes from a blue to a blue-violet upon which it was seldom possible to have two persons agree For this reason, as soon as some triketohydrindenhydrat was obtained the biuret reaction was abandoned, and with it disappeared all the difficulties in the interpretation of results

Triketohydrindenhydrat is put out by a German firm under the commercial name of ninhydrin, and it is by this shorter name that it will hereafter be referred to in this paper It is a whitish, quickly soluble powder, disnensed in amounts of o i gm in brown glass vials Accompanying each package is a circular describing the method of its use. As o 2 cc of a 1 per cent watery solution is the amount necessary for a test, the contents of a vial dissolved in 10 cc. of distilled water affords enough reagent for fifty tests. The only description of triketohydrindenhydrat in chemical literature, as far as we can determine, is that of Ruhemann 1 As it gives a blue color with all compounds that have an amino group in the alpha position, it is of great value in the recognition of the products of the digestion of protein.

The tests were continued, using ninhydrin IJ Chem Soc. London, 1910 ECVE, 2015

according to Abderhalden's technique. As ninhydrin is a reagent giving a reaction with the most minute amounts of soluble protein, precautions were redoubled in making the following tests. Although in a few instances the rolor reactions differed slightly in intensity, no difficulties of interpretation were encountered. The results of the use of this reagent in a second series of cases of pregnancy and of controls using sera of nonpregnant individuals follows.

TABLE II -DIALYSIS METHOD WITH NINHYDRIN

COLOR REACTION											
No.	Mouth of Pregnancy	Serum	plus plus plus cents	Pla ceuts	Aq Del	Peptone 0.7 per cent					
2 2 4 5 6 7	Ninth o days post partum Ninth 11 days post partum I day post partum Male	11111	+++++	=	=	+++++++++++++++++++++++++++++++++++++++					
5 9 10	Non pregnant female Eighth Eighth Sixth Second	=	++++	=	Ē	+++++					
14 14 11 10	6 days post-partum 7 days post partum 3 days post partum Ninth bixth Fith	1111	+++++	=	=	* + +					
17 18 10 10	Suth Sixth Seventh Fifth Nitth Earlith	111111111111111111111111111111111111111	+++++		=	+ + + +					
95 95 20 27 23	Ninth Eighth Eighth Ninth Seventh	1	1++++++++++++++++	1		+++++++++++++++++++++++++++++++++++++++					
30 31 32 33	Ninth 2 days after a months abortion Eighth Sixth Seventh 23 days post partium	11111711	*****			* + + + + + + + + + + + + + + + + + + +					
34 35 36 37	Eighth Ninth Ninth Ninth Felamotic	=	1	=	=	† †					

A very faint reaction Hemoglobin statoed scrum

It will be seen that, using ninhydrin as the indicator, the results of Abderhalden are in nevry way duplicated. In a series of 25 pregnant and 8 post-partum women constant positive results were obtained, while in the two controls (one a male) the reaction was negative. The ninhydrin test gave always frank reaction during pregnancy; in 3 of the 8 post-partum cases the reaction was faint, the control by serum alone was always frankly

negative except in the case of two slightly hæmoglobin stained sera.

The significance of the test in the postpartum penod is still doubtful Abderhalden, as well as Frank and Hefman, reports results which indicate that the reaction is weak-ened or disappears shortly after the end of pregnancy. This view is supported by our weak reaction in three tests made during the post-partum period. The evidence on this point is, however, insufficient to allow a final concession.

With the exception of one pregnancy at the end of the second month, this study does not unclude a pregnancy earlier than the fifth month. The experience of Abderhalden and of Frank and Heiman, however, indicates that the test is applicable to any period of pregnancy after the second week.

Control experiments Thus far in the investigation it had been impossible, on account of the difficulty of obtaining large amounts of serum, to make control tests of the action of the serum of pregnancy on tissues other than placenta When, however, the very successful senes of results shown in Table II had been obtained the question of control observations was taken up not only in regard to the effect of the serum of pregnancy on tissue other than placenta, but also the effect of the serum of normal individuals and of individuals suffering from various diseases upon placenta and other tissues Upon these points Abderhalden offers little assistance. His results as printed show controls with non-pregnant women but no controls with sera from individuals suffering from disease Furthermore, a close examination of his descriptions of the dialysis method fails to reveal (with the exception of two instances in which liver was used) an experiment showing the action of the serum of pregnancy on tissues other than placenta Our control observations, in view of the brilliant results shown in Table II, have heen most disappointing. The serum of pregnancy gives the reaction, as shown in Table III, with a number of tissues other than placenta

Such results indicate that if the reaction is due to an enzyme, it is a proteolytic enzyme in no way to be considered as specific for pla-

TARLE III -CONTROL OF TISSUES

No.	Mosth of Preg. nancy	Serum	Serom plus Pla centas	Serum plus Uterus et Term	Serum plus Normal Uterm	Serum plus Carcino- matous Uterus	Serum plus Kidney	Serum plus Kidney (Dog)	Serum plus Heart	X.13	L'terus at Term		Carci- noma- tous Uterus		Kid- ney (Dog)	licart
	Ninth Ninth	-	#	‡,	-					Ξ	=			-		
3 4	North Eighth	Ξ.] ‡	‡1	j					=	Ξ			l		
5	Ninth Seventh South	+	1 ‡	‡ ,						=	=					[
8	Fighth Ninth	} <u>-</u>	}	1	ì	Ì	٠,.		4.	Ξ	=			_	ł	
10	Ninth Lighth	=	+	1	+		1	ĺ	+	-	-	-		=		=
13	Ninth I day }	-	+	İ)	+	,	+] -					-	
13	post partum 25 doys	-	+	1	ĺ	f * '	,	· ·	(_	í II		-	-	-	
14	post partura	-	+	+1	1	1	}	1	Ì '	-	-					

centa (chorionic) protein This, however, would not detract greatly from the value of the method as a clinical procedure if the reaction was obtained only in pregnancy may, however, by the method employed, occur when normal sera or the sera of various diseases are used. This is shown in Table IV

TABLE IN -CONTROLS WITH SERA OF NORMAL AND DISEASED INDIVIDUALS

No.	Condition	vereta	Serum plus I lacenta (Human)	Series ples Auther (Human)	Servin plus	Phoenta (Homan)	Kidney (Ruman)	Kalney (Dog)
3 4 3 6 7 8 0	Male (healthy) female non pregnant Male (healthy) Male (carbuncle) Male (healthy) Male (healthy) Male (healthy) Male (healthy) Male, nephrite Male nephrite Tabes, temale, see 60	111111111111111111111111111111111111111		++++ +++	++++ +++	1111111111	1111 1111	1111111

Serum hemoglobin stained

One hesitates, in view of the great importance accorded to all of Abderhalden's work. to offer adverse criticism, and for this reason we have controlled possible sources of error in our own For example, the reactions due to hæmoglobin or to recent ingestion of food have always been before us as possible sources of error, but these have been eliminated Only one precaution urged by Abderhalden the use of the biuret as well as of the ninhydrin test - has not been followed, but our unsatisfactory results with the biurct reaction has satisfied us of its inaccuracy. Moreover, our controls have been most perfect, and have been carried to the point of testing with the same tissue alone and the same serum alone, the sacs in which unexpected positive reactions with a combination of such tissue and serum have occurred

That in these control tests we have used chiefly serum from males rather than females does not seem to be a possible source of error.

The results presented in Table IV would seem, therefore, to indicate, provided always that our method is not at fault, that the proteolytic enzyme, if it be such that causes the reaction, may be present in normal individuals, and although increased in pregnancy (as the constantly uniform results presented in Table II would imply), may be increased likewise in conditions of altered metabolism other than pregnancy

That our experience in obtaining positive results with tissue other than placenta and with serum other than that of pregnancy is not peculiar is shown by the work of Fauser. who, with two exceptions (Frank and Heiman, Franz and Jarisch) offers the only communications on the subject which have not come from Abderhalden or his associates. Tauser studied the sera of individuals with disease of the thyroid, with dementia præcox, syphilis, tabes, paralysis of the insane and other forms of nervous or mental disease. As his problem was in part the relation of certain psychoses to the internal secretion of the sexual and other glands, he used as tissues to be acted upon by the sera, testicle, thyroid, and brain. The results were very irregular. The serum of Basedow's disease in three cases reacted with both thyroid and brain. the serum of dementia pracox reacted in three cases with both brain and testicle, and in a fourth with thyroid also. In practically all his cases of nervous or mental diseases the serum reacted with brain or cord, but no controls are given. Fauser forms several hypotheses concerning the relation of the glands of internal secretion to psychoses, but the unbiased observer cannot avoid the conclusion that his experiments are inadequately controlled.

If, as we have shown, the serum of pregnancy will react with tissue other than placenta, and the sera of nephritis, tabes, carbuncle, and occasionally normal sera will produce the same reactions with placenta and other tissues, and if, as Fauser's experiments show, reactions may be obtained by the use of the sera of goitre, syphilis and nervous and mental diseases, with thyroid and brain tissue respectively and sometimes with testicle, it is evident that the method cannot yet be utilized as a specific clinical test In connection with this statement we desire to emphasize the fact that our remarks refer only to the dialysis method with ninhy drin as an indicator. The optical method, which we have not used, may give entirely different and more exact results It is, however, the dialysis method which can most readily be used as a clinical method

On one other point we have had difficulty in reaching the same conclusion as Abderhalden. If serum is inactivated by exposure to temperature of 60° C for one half hour he finds the reaction does not appear. This is offered naturally as evidence that the reaction is due to ferment action We have inactivated five sera of pregnancy but have never been able in this way to entirely prevent the reaction (see Table V) Inactivated serum has, however, always caused a less marked reaction than the control untreated serum, a reaction which when obtained under other circumstances has been called "very faint." When, however, the mixture of

TABLE V-EFFECT OF NORMAL AND HEATED SERLM

Case Num- ber	Month of Preg- nancy	treated Serum	Placenta	Serum in- activated	plus Placenta	Placenta
;	Vanth	=	±	=	#1	=
	(heal'y) Nuth	-	1 1	_	1] [
3	Auth Eighth	7	÷ :	±'	‡	=
	examp.					

A cry faint reaction 1 Serum 14 hours old

serum and placenta is placed in the refrigerator (o to 3 C) the reaction does not occur. This indicates that whether or not the ferment is specific the reaction is one dependent on enzyme activity

Another point of interest is that a serum of pregnancy several days after being drawn does not lose its power to produce the reaction with placenta. One scrum was tested at intervals for one week. At the end of seven days the tests with placenta were still positive, and the serum alone gave no reaction Tests for longer periods have not been made

Our difficulties with the control tests have led us to try a modification of Abderhalden's method If the reaction is due to a proteolytic enzyme, the products of this activity, amino-acids, should remain in solution and be unaltered after coagulating a mixture of serum and placenta by heat and acetic acid. The use of the method of dialysis has for its object the separation of products of protein digestion from the unaftered serum proteins may be removed just as well by filtering them off from the coagulated serum proteins The only objection is that amino-acid might be present in the serum used for the test; this danger, however, is present also in the dialysis method The coagulation method has, moreover, one very important advantage over the dialysis method, if properly performed there is never any question of an unexpected positive reaction being due to the presence of serum which may have escaped through a faulty sac or been introduced accidentally into the dialysate

We have, therefore, after testing for aminoacids a number of filtrates of normal sera with negative results, abandoned the dialysis sacs and adopted the following technique:

417

Measured amounts of serum are placed in several tubes, and to one is added boiled placenta, to others boiled kidney, or heart, or whatever the control may be, and with one tube containing serum alone, and others the tissues named above, all are placed in the thermostat at 37° C. for 24 hours. At the end of this time the contents of each tube is poured into a separate heaker, diluted with 20 cc of water, boiled with the addition of acetic acid, and filtered To 10 cc of each filtrate the ninhydrin test is applied. Although so far we have tried this method with only a few sera, it has given excellent results (see Table VI)

TABLE VI-TESTS WITH BOILED FILTRATE AND NINHYDRIN

Case	Month of Pregnanty	Serum	Serum p'us Placentat	Serum plus Audaey	Serum plas Dog Kidney	Senim plus Brems	Pircente	Kidney	Dog s hadary	Uherus
1	Ninth Ninth Ninth	Ξ	‡		_		Ξ			
4	Eclamptic formal male Ninth Eighth	Ξ	+	- +	=	=	~ ~	=	Ξ	Ē
_	Eciampt e	j -	+	+	+	+	~	-	<u> </u>	-

All tissues human except doe a kidney as indicated

The positive reactions are always well marked and equal in intensity to those by the dialysis method. Also we have found that if coagulation is complete, so that the filtrate is clear, the difficulties due to hæmoglobinstained sera disappear. Great caution must be observed, however, in the coagulation. Some filtrates have an opalescence, and these should be coagulated a second time. As an extra precaution, we have found it wise in all cases to add a few drops of dilute acetic acid to all filtrates and to boil a second time and watch for clouding before adding the ninhydrin solution. How this modification will stand the test of further work remains to be seen.

SUMMARY

The use of Abderhalden's test for pregnancy, employing the dialysis method and the ninhydrin color reaction, has given positive results with each of 28 sera from pregnant women and 8 from women in the post-partum

period, including one after abortion. The test has never been negative in a known pregnancy. On the other hand, the serum of pregnancy reacts with tissues (kidney, heart, uterus) other than placenta, and indeed with other than human tissues (e. g., dog's kidney). Also sera of two cases of nephritis, one of tabes and one of infection (carbuncle), and occasionally of some individuals apparently in perfect health, have given the reaction with placenta

and other tissues In the use of Abderhalden's dialysis method we have found the ninhydrin reaction far superior to the biuret reaction. It is also important that Schleicher and Schull's smaller dialysis sacks should be used rather than the fish-skin membranes originally recommended.

Results as satisfactory as those by dialysis are obtained by mixing tissue and serum in tubes and, after incubating for 24 hours, testing the filtrate obtained on coagulation by heat and acetic acid with ninhydrin.

Inactivation of the serum causes a great diminution in the degree of reaction but does not cause it to disappear entirely At zero temperature no reaction occurs The power of a serum to cause the reaction persists, when the serum is kept under proper conditions of temperature, for at least seven days.

As the result of our studies we feel that this test cannot be accepted as an accurate clinical method until it has been more thoroughly investigated and the possible sources of error corrected. This conclusion, however, applies only to Abderhalden's dialysis method, and not to his optical method, with which we have had no experience.

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THE EMPLOYMENT OF PROTECTIVE ENZYMES OF THE BLOOD AS A MEANS OF EXTRACORPORTAL DIAGNOSIS

I .-- STRO-DIAGNOSIS OF PREGNANCY BY CARRY PRATT MCCORD, M. D. Dersoit

A the parenteral introduction into the blood of substances in any wise dil ferent in structural form from such as normally occur, there arise enzymes capable of disintegrating these foreign materials and transforming them into forms not qualitatively different from normal blood constituents In short, parenteral digestion takes place. The portal of entry for such materials is from overloading the intestinal tract so that some food passes through the enteric barrier in complex form, from intravenous and intra-abdominal injections, or from the organs of the body that, from their individual specific nature, when thrown in the circulation as unchanged albumins are no less foreign than parenteral injections from without the body

This formation of protective enzymes then is, sensitization, and all the phenomena of anaphylaxis and immunity are closely allied In this phenomenon is the basis for all prophylactic vaccination and the foundation for the curative activity of such substances as tuberculin Although physiological in its nature, this disintegrating of stable proteins is not without its deleterious action as ev idenced in the autointoxications

Such an enzyme cleavage of proteins under he the various cutaneous reactions, such as lepro-diagnosis, tuberculin reaction and the cutaneous diagnosis of aphilis uhenomena come as a result of introduction and cleavage of sub-tinees of a kind like unto that with which the organism is sensitized Not only will this cleavage take place within the body, as in the instances cited but the drawn blood contains the active enzymes, and when placed in contact with substances against which they were generated, structural disrupting occurs extraconvorcally, with a breaking down into simple forms similar to that occurring intracorporeally

This held opens up unlimited possibilities for usefulness in diagnosis. The excellent work of Abderhalden (r) has developed many interesting facts which are likely to prove useful to both the clinician and the technical worker Abderhalden's personal attention has been given largely to the sero-diagnosis of pregnancy, which is based wholly on the principles appearing above. His methods are, however, applicable to many phases of the same field These methods, with modi fications of our own, have been successfully employed in the present experimental laboratory study of the sero-diagnosis of pregnancy and the sero-diagnosis of toxic goitre. This paper deals only with the sero-diagnosis of pregnancy, and will be followed by a second paper on the diagnosis of toxic goitre

THE SERO-DIAGNOSIS OF PREGNANCY

The utility of such a method of disgnosis of pregnancy, if found trustworthy, is too obvious to need comment. It has long been known that the placenta, in its developing stage and period of growth in particular, discharges into the maternal circulation microscopic portions of the chorionic vill. The nauvea, vomiting and other signs of intoxication are probably concomitant to the entrance of these extranceus placental portions. On their appearance in the circulation, enzy mestaltively specific against chorionic vills are mobilized by the body, to which the name "choriolysins" has been given. It is around this phenomenon that the work centers.

EXPERIMENTAL METHODS

Preparation of placenta The placenta of humans, cows, dogs and guinea pigs were used The placentæ were obtained at earlier stages than complete gestation, save in the case of women. These were obtained from normal patients in normal labor placentæ were freed from blood completely Flushing through the umbilical vessels removes much of the blood at once The fortal membranes and cord were removed and discarded The removal of the remaining blood content was facilitated by cutting into small portions and placing in a sieve under a running tap On complete freeing from blood, the placenta were placed in boiling water in a porcelain dish and boiled Contrary to the experience of Abderhalden, we found that boiling for two five-minute periods was rarely sufficient After boiling for five minutes the water was drained away and the tissue rinsed thoroughly and reboiled for a period of ten minutes A 5 cc sample of the boiling fluid was tested, in the manner described by Abderhalden and later in this paper, for non-coagulated protein If positive, the process of changing water and boiling was repeated until the test was negative. Twenty to thirty minutes of actual

boiling was necessary on the average. The placenta and fluid were poured into a largemouth bottle and covered with toluol and tightly covered. This preparation was kept in the cold room to prevent deterioration

Desiccated placental preparation. We found a more permanent and more easily handled preparation of placenta was to be obtained in the following way. The placentæ were boiled (after being washed free of blood) in the manner described above until the fluid on boiling with the reagent was negative. Totuol was added The placental pieces were then rapidly ground to a fine paste in a Latapie grinder, and repeatedly extracted with pure acetone until the acetone remained uncolored from the placenta. The acetone was separated from the placenta by filtration through a Buchner funnel with exhaust. The placenta was dried in vacuo in an atmosphere of toluol vapor at room temperature On complete drying, the placenta (at all times protected from contamination) was ground to a fine powder. The finished product is a fine, nearly white powder. was used in the same way as the coagulated placenta, and by comparison with it in the same cases was found equally trustworthy.

Obtaining of blood serum The scrum must be obtained from the patient within a few hours prior to making the test. At least 3 cc of clear serum is necessary, so that from 6 to 10 cc of blood must be drawn. The serum must be free from hæmoglobin. The hæmoglobin itself is probably non-consequential, but its presence indicates the disrupting of blood cells, with the liberation of enzymes capable of vitiating the true condition. To obtain perfectly clear serum offers considerable difficulty. In animal work it was comparatively easy to obtain such a serum by drawing blood directly into small centriluge tubes and quickly throwing down the cell content before coagulation occurred. Of this the upper half is usually a clear, hæmoglobinfree coagulum. By placing a glass bead on this and recentrifugalizing, a clear serum is expressed. In actual clinical work, clear serum usually may be obtained by drawing the blood from a vein of the forearm of the patient with a syringe, as for a Wassermann test. The blood is transferred immediately to small 5 cc. tubes and centrifugalized as described above, if suitable centrifuge is available. If no centrifuge sufficiently powerful to throw down blood corpuscles is at hand, the serum may be obtained by transferring the blood from the syrings to 5 cc paraffined tubes packed in snow or ice. The blood thus kept cold is delayed in its coagulation so that the corpuscles tend to settle to the bottom. When coagulation does occur, the upper half again is relatively free from harmoglobin, so that on standing a serum is spontaneous that on standing a serum is spontaneous plobin, expressed that is usually free from harmoglobin, so

Dialyzing apparatus The most prolific source of error arises from the dialyzing mem branes Abderhalden employed fish bladder kondoms in his original work, and later used and recommended the parchment thimbles of Schleicher and Schull In our work collodion thimbles of about 20 mm diameter were employed in a satisfactory way, except that it is difficult to obtain these collodion sacs of equal thickness so as not to interfere with the rate of dialysis The parchment tubes were open to the same objection. Each tube had to be tested for weak spots and pin holes. Some tubes were entirely too thick, while others were too thin. These parchment tubes, after elimination of such sources of error, were by far the most serviceable and dependable of the forms of dialyzing apparatus investigated. These, with proper cleaning, may be used repeatedly.

The triketohydrindenhydrat reaction. This reagent was the chemical test for the dialyzation products. The material used was in part the market substance of Meister Lucius and Bruning, and in part supplied by Dr V. L. King of this laboratory, who in addition has supplied the data for the description of the chemical nature of the substance.

To detect the digestion products of proteins (placenta) in Abderhalden's biochemical test for pregnancy, a reaction was required which was extremely sensitive. In the digestive process albumin is degraded gradually, so that under the conditions of the test, only the dialyzable products being separated, peptones and amino-actios are the substances

to be detected The biuret reaction, which was discovered by Rose (2), is a method of detection of soluble substances possessing $NH(CONH_2)_2$, $(CONH_2)_2$, $CH_2(CONH_2)_2$, acid amide groups, when two -CONH2, groups are connected by a N atom, a C atom, or directly to one another. The peptones contain two such groups and give the biuret reaction very strongly. As the digestion proceeds an vitro, however, the peptones are converted still further to the amino-acids and hence the solution to be tested will contain largely a-amino-acids rather than peptones The ideal reagent, therefore, is one which is specific for a-amino acids From among the numerous substances available, Abderhalden found indantmone hydrat (triketobydrindenhydrat) to give the most reliable results. The amino acids resulting from the digestion of albumin are always a amino acids. other kinds have ever been found Indantrione hydrat reacts only with the a acids. although it also reacts with peptones and all substances containing acid amide groups to form soluble violet dves The solutions are dichroitic and appear red in transmitted light The indantrione has become available through the researches of Ruhemann (3) and Perkin (4). It is prepared from cinnamic acid according to the following reactions

C.H.CH-CHCOOH — C.H.CH,CH.COOH
C.H.CH.CH.CH.COCL

C.H.CH-CH-CH-COCL

C₂H₂CH₂CH₂COCL
Phenyl proposic acid chloride
Friedel-Crafts synthesis C₄H₂H₂CH₂CO
Indanone

Condensation with p-natroso dimethyl anilm to a substituted anil and subsequent hydrolysis

C'H' CO C(OH)

Indantrione hydrat

The test. One half gram of the coagulated placenta or M gram of desecrated placenta is placed in the parchment thimble. This thimble should be washed throughly just prior to use Add to the placenta in the tube 1½ cc. of serum free from hemoglobin Avoid any contact of placenta and serum with outside of thimble. As a further pre-caution riose thoroughly on the outside Place in dialyzing jar containing to to 20 cc distilled water. A large test tube makes a

suitable dialyzing iar. Add a layer of toluol to the surface of the water and to the thimble contents to prevent deterioration. In like manner prepare a control test in all respects similar except no placenta is added to the serum. This control is essential and no test is dependable without it. These tubes are tightly covered and kept at body temperature (incubator) for a period of 12 to 16 hours At the end of that time the dialysates are tested with triketohydrindenhydrat to cc. of the dialysate and place in a test tube To it add 2 cc. of a 1 per cent solution of triketohydrindenhydrat Boil continuously for one minute If positive, an intense violet color appears during the boiling and remains The amount of color is a relatively quantitative indication of the degree of positivity Boil control in same way Compare color of control and test No case is to be considered positive unless the test is more positive than control The color deepens on standing, so that the sharpest difference in degree of color appears after standing for about 15 minutes

INTERPRETATION OF RESULTS

The value of the test lies not so much in the positivity of the test as in the relative negativity of the control Contrary to Abderhalden, in animal work our controls were nearly always faintly positive, even when all mechanical sources of error were removed This fact is very reasonable, for the blood contains amino groups in easily detectable amounts from digestive processes Serum drawn at the height of food absorption contains more amino groups that are readily dialyzable, but even on starvation some serums give positive reactions after dialyzation. Further, in the case of pregnancy blood may be drawn just at the time of intracorporeal digestion of chorionic villi from the patient's own placenta. In this case the digestion would continue extracorporeally, and give rise to a positive test Quite obviously the two thimbles used in dialyzing must be of relatively equal thickness, for a thin control tube would be readily penetrated by the small amount of contained amino groups, while in the presence of pregnancy even, the test, if made in a much thicker thimble, would with difficulty be penetrated and would give rise to questionable results. A test, to be positive, must, after removal of mechanical sources of error, give a more pronounced coloration than the control The control may be negative, then any violet coloration in the test is an indication of pregnancy. Equal coloration of control and test is a negative indication In our hands tests were made in the above manner, using as control not only the serum without placenta but placenta in distilled water and in using the desiccated placenta, the coagulated placenta of Abderhalden was used as a further control Results are based only on laboratory experiments These yielded about or per cent of accurate tests. These we were able to follow up by autopsy and exhibition of the feetuses or the demonstration of nonpregnancy Errors of technique account in the main for the remaining 5 per cent However, in the presence of unquestionable pregnancy, negative tests have occurred in two experiments The paucity of data from clinical work does not allow any records being included in the present paper What we have, however, would suggest that the test is more accurate for human subjects than for animals, in that the controls are many times negative or only faintly positive in women, while in laboratory animals the blood serum normally dialyzes to the extent of giving positive andings in the controls. The decision between positive and negative tests is never doubtful in the human.

These observations are based on 240 tests under varied conditions and at different stages of pregnancy Our findings lead us to conclude that the sero-diagnosis of pregnancy is both reliable and practical The method has its limitations, and the technique requires great care In the hands of the careful worker the method is of sufficient merit to prove of great value to the obstetrician and gynecologist.

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DEPARTMENT OF TECHNIQUE

REPORT OF THE RADICAL OPERATIVE CURE OF A DOUBLE OBTURATOR HERNIA!

BY C VAN ZWALENBURG, M D, RIVERSIDE, CALIFORNIE

B COLEY, in "Keen's Surgery," says, "Obturator hernia is extremely rare, only 200 cases having been reported This was in 1907 and since then several have been added. The diagnosis has rarely been made until strangulation had occurred, and even then the true condition has not been made out until after operation had been performed, on the supposition that the patient was suffering from intestinal obstruction of unknown origin. At the Hospital for Ruptured and Crippled, in New York, in upwards of 75,000 cases observed since 1800, not a single case has been noted. It occurs usually in emagiated old people in the proportion of 144 women to 23 men. Of 21 cases collected from the literature, treated by laparotomy, o were successful, or 42.85 per cent. In 103 cases of obturator hernia collected by Schwarzschild, no operation was performed in 62 cases, of 43 cases operated upon, 17 were cured. The method of operation in the cured cases was femoral incision in 13, laparotomy in 3, a combination of both methods in one. An artificial anus was established in a, with a deaths, intestinal resection was done in 5 cases, with 1 recovery"

The obturator foramen is ordinarily no larger than sufficient for the passage of the obturator nerve and blood-vessels. It is found doubly protected by the obturator internus and externus and pectineus muscles. When the foramen becomes enlarged for any reason, usually loss of fat, these muscles still protect, to a large extent, as the muscle fibers originate from all the margins of the opening. When a hernial sac pushes itself out into these muscles its progress is very quiekly arrested by the strength and activity of the muscles, so that an obturator hernia is afways small, forming a little cone-shaped pocket in these muscles, containing very little intestine. In fact, a goodly share of the strangulations recorded are of the so-called Richter type, that is, strangulating only a portion of the lumen of the This small size of the herma makes it al-

most impossible to palpate, in fact there are very few cases in which a tumor can be made out. The only important symptom laid down as point. ing to an obturator herma is the so-called Howship-Romberg symptom, which consists in pain and sensory disturbance along the inside of the thigh, due to pressure upon the obturator nerve, This symptom, however, is present only exceptionally, and may be produced by various other conditions, and it is only of confirmatory value, Since all of the cases recorded were strangulated at the time of observance, the treatment has consisted usually of simply relieving the strangulation This has been done generally by abdominal section, as the indications were for an operation and for the relief of intestinal obstruction of obscure origin A few, however, have opened down upon the obturator herma externally, and relieved the strangulation by incising the ring of the sac Some have used the combined method. opening the abdomen and also cutting down upon the obturator foramen in the thigh Some attempts at radical cure have been made, first, by covering the opening externally by muscle fibers taken from the obturator and pectineus muccles, second, by closing the opening with fascia from the neighborhood, and lastly, by an osteoplastic flap, originally proposed by Trendelenburg and Kraske in 1801 for large femoral herma Schwarzschild operated for radical cure upon an obturator herma, strangulated for the third time lie chiseled a periosteal flap from the inner side of the symphysis pubis and the descending ramus and placed it directly over the hernial opening, holding it there with catgut

sutures.

I have been unable to find the record of a single case of radical cure undertaken in the absence of strangulation

My patient, Mrs. A., aged 76 was first seen December 24, 1010 She was markedly emacrated, weighing 110 pounds, though her height was five feet six inches, and formerly-she had weighed 130 pounds. History. Mother of four children. Has usually been well, but never robust Twenty-six years ago she began to have attacks of abdomipal pain, colicky in character, coming suddenly and continuing from a few minutes up to two or three hours, rarely they are accompanied by nausea and vomiting They occur all the way from once in six months to twice a week-Until about four years ago the pain was referred to the right side of the abdomen, low down and sometimes radiat ing to the right thigh. Since that time the pain has been more frequently referred to the left side, however, it may occur on either side, but she is usually right in predicting that when it occurs on the right side, it is less severe and of shorter duration During the last six months she has had frequent slight attacks, interspersed by severe attacks (lasting upwards of half an-hour) as often as once a week. During these In enty-six years she has been variously treated for stomach trouble and various other forms of digestive disturbances, she has been dieted until she is very cautious about what she cats, and has reduced her diet to a minimum, no doubt increasing her emaciation

The sudden onset and the colicky nature of the pain pointed to some form of strangulation, due to the twisting of some addominal organ or to herma. My first search was in the pelvis Bimanual examination revealed no cause for the pain At my second visit, on the organization a severe attack, the patient spoke of the pain radiating along the inside of the thigh as far down as the knee At one time, the first intimation she had of colic was an exeruciating pain in her foot, extending up the limb Another suggestive symptom was the fact that three or four years ago she had discovered that the knee-chest position, or anything approaching an inverted poution of the abdomen, was likely to ease up the pain Turther investigating the obturator region, I found that when an attack of colic was on there was tenderness over the obturator foramen Releasing the adductor muscles by carrying the limb over to the opposite side, by rareful palpation I imagined there was a little fullness in this region, such as a protruding herma would produce, but I was impressed by the difficulty of locating a protruding small mass under these muscles, even in a patient as emaciated as Mrs A I was able on two or three occasions by pressure and manipulation over the foramen, to relieve the pain, and after the relief of the colic no tenderness could be elicited in this region. The diagnosis of left obturator hermia scemed complete

Summing up 1 The sudden, unheralded onset of the pain 2 The coldey nature of the pain 3 The readation along the obtunctor region 3. The relief from pain by presture 6 doubtunctor region 3. The relief from pain by posture 6 doubtunctor region 3. The relief from pain by posture 6 doubtunctor region 3. The relief from pain by posture 6 doubtunctor region 3. The relief from pain by senter of the pain and the dauger of strangulation, operation for radical cure was advised and finally conscriet for it was performed on made through the left rectus. The Trends and mustom made through the left rectus. The Trends and mustom made through the left rectus. The Trends and mustom pain for pain a painting engaged painting receiving the medic fanger, a pain of artery champs was interested into the opening, and the interior of the sax increase of the through the painting and the interior of the sax made and the painting and the interior of the sax made and the painting and the interior of the sax made and the painting and the interior of the sax made and the painting and the interior of the sax made and the painting and the interior of the sax made and the painting and the interior of the sax made and the painting and the interior of the sax made and the painting and the interior of the sax made and the painting and the interior of the sax made and the painting
A chromicized catgut suture was now passed in and out along the inverted sac and the whole thoroughly quilted down upon the obturator foramen, unitating a method I had seen C. H. Mayo use in a femoral hernia from the inside of the abdomen when it was opened for some other diseased condution. It is a modification of the Kocher inversion of the sac in inguinal hermia, there is no outlime.

the sac back and forth through the muscles as is done by the Kocher method The assurance given us by Dr Mayo that it was a perfectly rehable method gave me confidence to try it here, as the mechanics seem to me practically identical in the two forms of hernia-the sharp edges and the small sac. The right obturator foramen was large enough to easily receive the little finger. This sac was also inverted and closed in the same manner that the left had been A mass of fat was found adhering to the sac, and this in part accounted for the fact that an attack of colic radiating to the right side would not seem as severe as one referred to the left side, evidently less intestine was forced into this opening The abdomen was closed, and the patient made an uninterrupted recovery She walked out of the hospital March 27th, thirteen days after the operation, and has been perfectly free from colic or any other disturbance since that time, now twenty months

It seems quite remarkable that this patient should suffer all these twenty-six years from these repeated attacks of colic, which were undoubtedly due to a semt-strangulation, without ever going on to a complete strangulation. History of repeated colic in these cases is quite common. In seeking for the cause, we find a firm, sharp edge of the obturator membrane making up considerable of the circumference of the opening through which the hernia protrudes. The lack of pliability, together with the sharpness of the edge, must increase the likelihood to colic and to strangulation as compared to herma in other localities. In this case, this long period of colic without complete strangulation gave an excellent opportunety for study of the case and greatly facilitated the making of a diagnosis. The prominence of the Howship-Romberg symptom also aided materially, although it was hard to elicit this history, in fact, some of its more striking features were never disclosed until after the operation and recovery, especially the one referring to pain in the foot This was an exaggeration of the ordinary pressure symptoms on the obturator nerve, which might be confusing but is explained in the light of the entire history and the finding at operation

Next to the diagnosis, the treatment is the other interesting consideration in this bernia. That the abdomnant route to operative treatment is the preferable one secured to me quife evident, and is, I think, now generally accepted. Aside from the indication to open the abdomen for strangulation, it is better to close the inner end of the "ttube" into which the hernia passes than the outer end; to say nothing of the difficulties of working under the muscles which cover this region. The rigidity of the edges of the obturator opening makes it difficult to permanently repair it. It is impossible to suture it directly. A radical cure is reported by Korner and Huggins!

The Lancet, January 13, 1000.

which was done at a third strangulation. In that case, the strangulation was first relieved by abdominal section; an incision was then made in the thigh with the expectation of closing the opening from this point. However, the tube-like character of the opening prevented prospects of a satisfactory result; closing the outer end would not prevent entrance into the inner end. The sac was then inverted and stitched down from the inside of the abdomen and the relaxed obturator fascin also closed. Discussing their paper before the Surgical Section of the Royal Society of Medicine. Barker asked if the sac could not have been inverted without the incision in the thigh. He had himself repaired a femoral hernia in that manner, and suggested that it might be used in obturator hernia as well Korner repbed that an attempt had been made to do so but had failed, and the thigh incr-ion had been considered necessary. Though this suggestion was made by Barker two years before my operation, I was not awate of it at the time

From this one experience I am not prepared to state that my method of closing would be absolutely the best in all cases It looks as though we were depending upon rather unstable tissues However, in a patient aged 76, who would give it little strain in the years still allotted to her, it would seem sufficient and the simplicity of the

technique reduced the time of operation to a minimum. I am sorry I have no evidence or statistics to offer on the final results of this form of closure of a femoral hernia. However, when we consider that the obturator, as well as the femoral opening, is originally largely closed by loose fatty and fibrous tissues, and that one of the causes of obturator hernia is understood to be the wasting of this fatty tissue, I feel a great deal of security in the plug which I made by quilting down the inverted sac upon the opening

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PROSTATECTOMY BY A COMPOSITE MICTHOD

BY A 1 ROCKEY, M. D. PORTLAND OREGON

Y the term "composite" is meant a method I that utilizes features of technique devised by various operators. These have been blended to form what the author at this time considers the best procedure in the facility of operation with minimum danger, speedy recovery, and excellence of final results.

The steps of this composite operation are as follows: suprapubic incision (Belfield, 1883, McGill, 1886), total enucleation by the index finger (Eugene l'uller, 1894), support of the protate by fingers in the rectum (Guiteras, 1898), scoring the apex of the prostate with the finger nail to start enucleation (Freyer, 1900), and intraurethral puncture with the finger to better conserve the internal sphincter." To this I bave added delivery of the large gland through the

small increan by traction with forceps, and finally, in completing the operation and conducting the after treatment, two features which, though I have satisfactorily used for several years. are now in print for the first time. They are s alvular suspension of the bladder by two sutures. and the total abandonment of irrigation, either at the time of operation or during the after treat-

This paper is based on a personal experience of over 300 prostatectomies and on the observations made in a recent pilgrimage to the principal prostatectomists of America and Europe. Individually and collectively, the profession is striving for the best results, and surgical procedures are being constantly molded to that end. In this effort for improvement the changes made

a St. Louis Courser of hied 1868 I Hentley Squier, Surg . Gynec. & Obst Nov . sqt : Read before the North Pacific Surpost Association, Sancouver, B C December 14 1911

in original methods are sometimes advantageous, but occasionally quite the reverse. To prove all things and hold fast to that which is good requires opportunity, experience, and judgment. The final adoption of this method is the result of the trial and abandonment of many features of operative technique and post-operative treat-

Consideration will here be given only to the treatment of ordinary prostatic hypertrophy It should be well borne in mind that the inflammatory, adherent, atrophic prostate and malignant disease of the prostate produce similar obstructive symptoms. The effect of stricture of the urethra, tabes and other cord lesions in producing urinary setention must not be overlooked. The diagnosis, if possible, should be thoroughly established before the operation is undertaken, keeping in mind the important fact that every ease of urinary obstruction in men past middle age may not be caused by prostatic hypertrophy.

Before proceeding with a detailed description of the composite technique, there are two points that we may well discuss. They are the choice

of route and the anasthetic. Twelve years ago a strong sentiment in favor of the perineal over the suprapubic method in prostatectomy became prevalent. It was quite usual, from that time and subsequently, to find in the first paragraphs of papers on prostatectomy the statement that the suprapubic route was attended by a higher mortality than the perincal It was advocated that the perineal operation was done under unobstructed view, which is quite true of a part of Young's operation as he does it, but is by no means true of the majority of those who attempt to follow his method, and is not at all true of other permeal operations. I have witnessed some woeful digging in bloody fields during the performance of perincal prostatectomy The claim for a smaller mortality in perincal operations is a fallacy, which has been repeated from one to the other until it is accepted as a truth The claim for better conservation of sexual function or urinary control has not been proved in practice. It is now very generally conceded that in these particulars also the suprapubic operation gives better results. The pendulum of choice has now swung the other way, and I think it safe to say that at the present time, the world over, nine tenths of the operations for removal of the prostate are done by the suprapubic route.

A word on the important question of mortality. By the composite operation in ordinary prostatic hypertrophy, if the patient is even in fair condition, there should be no mortality. If the patient is uramic from renal insufficiency caused by long continued back pressure from an overdistended bladder, vesical drainage either by the retained catheter or by suprapubic incision should be instituted until the patient shows signs of reviving Suprapuble incision in such a case, if the bladder is overdistended, can be made without anæsthesia by an instantaneous stab wound through all the tissues directly into the bladder. This should be done only when the distended bladder can be palpated as a tumor extending to near the umbilious In the cases that require it the stab wound is as painless as the puncture of the aspirator needle These patients are usually in a semicomatose condition. Drainage is made by a vertical stab about 1 of 11/2 inches above the pubic bone, the edge of the blade being downward, and a cut about an inch long being made toward the pubes as the knife emerges If the patient rallies, suprapubic prostatectomy may be done a few days later through a slight

extension of this incision Prostatectomy by the composite method, if properly done, should be a short operation. The gland can usually be delivered in from 4 to ro minutes, and the introduction of the suspension sutures and the finishing stitches will occupy but a few minutes more. In this matter, however, experience and definess have much to do with the time required and the smoothness of the operation Recently I operated on a man 70 years of age, whose left hip was ankylosed in a position of slight adduction. This would make the usual rectal elevation with the left hand a little less convenient, so I decided to do the enucleation with my left hand, using the right to support the gland The prostate was of medium size, soft, and easily enucleated, but it required 7 minutes to deliver a gland that ordinarily would have been delivered in 4 minutes. Notwithstanding my general experience in prostatectomy, at was the only one I had ever done with the left hand It illustrated well to me the advantage of the special training that experience gives in this manipulation

Ordinarily, ether is the anæsthetic of choice, A preliminary hypodermic of 1 of a grain of morphin and 110 of atropin, or 100 of scopolamin or hyoscin may be given. This not only has the advantage of quieting preoperative anxiety and diminishing the amount of ether necessary, but tends to allay post-operative pain. Recently I have employed spinal anæsthesia with stovain almost exclusively. It should be

remembered, however, that the use of this or any other nerve-root anasthetic in the spinal canal requires special training and great care, and that at the present time the mortality from its use in all conditions exceeds the mortality of ether. To offset this, however, we have the fact that in aged men the kidneys and heart are frequently at fault, and in them are found contraindications for the use of ether. In this class of subjects, when properly administered. I believe that spinal anæsthesia is an exceedingly valuable agent. I have not seen nausea or depression in a single instance in which I have made use of it in prostatectomy. The anasthesia is complete, and with the distinct advantages that the abdominal muscles are thoroughly relaxed and that the anæsthesia continues for an hour or two after the patient is returned to bed, thus obviating post-operative pain. The very slight disturbance of the anæsthetic and operation is well illustrated by the case of one man who smoked a cigar while the operation was being performed and called for his luncheon as soon as he was returned to his room saying that he was hungry, as he had not been served with breakfast If a shock block is desirable in this operation, and it must be admitted that there is some evidence to support this contention, then we have in lumbar anasthesia an efficient block

To any who wish to study this procedure I earnestly recommend the perusal of the comprehensive article on "The Anatomy and Technique of Spinal Puncture," by Wm C Lusk,1 and the paper by Babcock in SURGERY, GYNECOLOGY AND OBSTETRICS for November, 1912, also those of Allen and of Bainbridge 2 After this, a little preliminary experience gained by using it in operations on the lower extremities will prepare the surgeon for its use in prostatectomy. An important point in using a heavier than spinal fluid medium is to keep the head and shoulders elevated on several pillows so that the stovain will not reach the respiratory centers If the anæsthetic line does not reach the abdomen within ten minutes the patient may he flat for a few minutes, careful watch being kept of the advancing anæsthesia, and head and shoulders being again raised when it has reached the proper point. The same elevation is to be maintained on the stretcher when the patient is being returned to his room and for several hours after he has been placed in bed The stovain solution should be made heavier than spinal fluid by the addition of sodium chloride With this position, a well-

Ann Surg, Phila Oct, 1921

placed puncture, and proper dosage, lumbar anaestbesia with stovain is ideal for prostatectomy. In favor of a short incision, it must be evident to any close observer that the critical part of the enucleation at the base of the gland is always out of the field of view, even when the top of the gland is uncovered by a long incision held apart by retractors. The surgeon who does not have confidence in his sense of touch gets but little aid from the bloody view at the bottom of the long retractors under a partly detached prostate. One of the supposed advantages of the wide open bladder is that the bleeding may be controlled hy packing Less than a year ago I saw one surgeon in New York do three consecutive suprapubic prostatectomies in a morning clinic. In all three he made a long incision and exposed the bottom of the bladder by two or three long retractors There was much sponging, and at the conclusion, besides a large dramage tube, be packed the bladder with numerous strips of gauze I have never bad occasion to pack the bladder in a single instance. In my experience, the only glands that have given any troublesome bleeding have been the inflammatory, adherent type, representing only a small percentage of the total number Since the use of irrigation has been discontinued even these cases have

given no trouble. In the ordinary cases bleeding ceases spontaneously in a short time The total abandonment of irrigation at the time of operation or during the after treatment has been followed by a distinct improvement of the convalescent period. The caustic effect of ammoniacal urine on the freshly cut surfaces is no longer observed and bladder sloughs are not The adherent blood clot is the best protection the tissues can have against this source of irritation and its associated infections. Under the blood clot the tissues are soon safely protected by infiltration with phagocytic leucocytes, and the bealing process is at once established bladder at once fills with clots, but these act only as hamostatics, as nature intended they should The drainage tube is also blocked by them The urine, however, keeps an open track for itself through the space around the outside of the tube. Presently the clots are dissolved by the unne. which becomes clear, the dramage tube opens, and the bladder closes around its sides Irrigation after the operation, either occasional or continuous, as formerly practiced, can do nothing but harm

On the tenth day post-operative, when the drainage tube is removed, I have in a number of cases irrigated the bladder through a catheter in the urethra, and then, while the clear water was flowing, has inspected the base of the bladder through a large, direct-vision cystoscope to observe the healing process. By this time the cavity from which the prostate was removed has become small and funnel-shaped, with the urethra at the bottom and the sides lined by granulations. The upper rim is the mutous membrane of the bladder. The cpithelium soon covers the granulation tissue, the lines advancing from the urethral orifice below, and the bladder wall above meeting on the sides of the small funnel!

The detail of the composite method is as follows Preliminary preparation by a dose of castor oil given thirty hours before time of operation, and by drinking much water up to four hours before operation, ether or lumbar anxisthesia; place patient flat on well-padded table, with chest and legs covered to keep him warm While the anæsthetic is taking effect shave the pubes and clean the surface. Do not prepare these nationts the night before and give them the worry of the process and the discomfort of wet dressings. The Trendelenburg position is not necessary With a soft catheter, when this can be introduced, draw the urine and fill the bladder with warm water. Where catheterization with any catheter is very difficult, and the bladder is well distended with urine, the operation may be proceeded with without any bladder irrigation. There should be one assistant, who may wear gloves. The operator stands at the left of the patient, and wears a glove on his left hand, but keeps the right hand bare. The index finger of the left hand is pressed firmly against the top border of the pubic bone at the middle The incision is to begin at the upper border of the finger and extend upward for a distance of 11/2 or, if the gland is large or the patient very fat, 2 inches. At one stroke the knife should penetrate through the fascia The fibers of the muscles are separated with the finger or handle of the scalpel, and the fat on the bladder surface pushed upward with the tip of the left index finger The scalpel is introduced onto the bladder wall, and drawn with the back upward to the upper end of the intermuscular incision This is in the space of Retzius, and ordinarily at least an inch, and sometimes more, below the peritoneal fold. The distention of the bladder with water and the upward stroke of the finger followed by the scalpel point are necessary to absolutely insure this. With these precautions the knife may be plunged boldly into the bladder, tipping then the point downward under the pubic bone, and finishing the incision by a single upward cut as it emerges. While the water is rushing out of the bladder, and before it has had time to collapse, the bare index finger of the right hand is thrust into the bladder. It sounds the bladder for stone, and determines the size, contour, and density of the prostate. The glove on the left hand is then lubricated and two fingers introduced into the rectum, raising the gland up to facilitate its enucleation. The method of Freyer, as modified by Squier, is then used in puncturing the base of the bladder over the apex of the gland just inside of the urethra

Squier calls attention to the fact that the oncoming hypertrophy pushes the internal sphincter upward into the bladder and then dilates it, pressing the middle or prolongations of the lateral lobes through this. He recommends that the finger puncture be made inside of the urethra, claiming that in this situation the internal sphincter is less likely to be injured. If his contention that the internal sphincter is dilated by the hypertrophy and that the gland rises above it is true, then the scissors cut of Fuller and the nuncture on the crown of the prostate as made by Freyer also come anside of the sphincter. This much is true that incontinence after either of these methods is very rare indeed. Only two weeks have intervened between the arrival of Squier's paper and this writing In that time I have done four prostatectomies, and have used his method of boring into the prostate just inside of the urethra

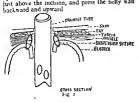
In proceeding with the operation, the prostate is steaded by the fingers in the rectum, and the tip of the right index finger is bored through the urethral wall on the crown of the prostate, preferably a little to one side of the midline When the nuncture is made in this way, the sense of touch readily determines the line of cleavage and is a guide to the operator in enucleation of the gland The finger is kept in the cleavage line and proceeds posteriorly, first to the left and then to the right, separating the internal orifice of the urethra around the crown of the prostate, then anteriorly, and lastly at the base, raising the gland and allowing the separated prostatic urethra to slip out of the gland. The urethra tears at its weakest point, which is above the openings of the ejaculatory ducts, thus leaving them and the vesical sphincter uninjured. In the very large myomatous prostate the lateral lobes may be separated with the finger and the

If the urine precipitates phosphates in the bladder or on the edges of the wound or on the satures it may be made acid by the administration of a to a co of dilute phosphoric acid or a few drops of sulphuric acid to be taken in a full glass of water three times a day



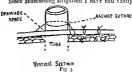
Fig r Rockey's prostatectomy forceps

gland delivered in two pieces. I have sometimes separated it only in front to facilitate drawing the large gland through a small incision prostate now lies free in the bladder. The glove is then drawn from the left hand, and, under the guidance of the left index finger, the delivery of the loosened prostate is accomplished by a pair of suitable fenestrated forceps. Formerly I used an ordinary sponge or tongue forceps. Recently, however, I have devised a special forceps for this purpose (Fig. 1) It has an oval blade with smooth edges, and a scalloned fenestrum which will hold the prostate without tearing any chance bit of the vesical mucosa which might be caught in its grip By care and a little manipulation a large gland may be quickly delivered through a small incision. The gland is soft and elongates as it is seized with the forceps, and the bladder wall is elastic. The enucleation of a large gland requires no longer bladder incision than a small one The room required for the delivery of the elongated gland from the bladder marks the limit of the required incision In practice, I find that in thin subjects a 11/2 inch skin incision and in ordinarily fat subjects a 2-inch incision is about right. In fat men, a distinct advantage in enucleation may be gained by having the assistant place both hands flat just above the incision, and press the belly wall backward and upward



After the delivery of the gland, the valvular suspension suture (Fig. 2) is introduced I regard this as a most important step in expediting recovery. The edge of the wound on one side is held back by a small retractor. A Robeson needle threaded with No. 3 catgut is passed through the fascia and muscle. The left index finger is introduced into the collapsed bladder and hooks it up and brings it into the opening. The edge of the bladder incision is seized with a toothed hamostat and drawn out until the needle can be readily inserted half or three quarters of an inch from the margin of the incision The needle then dips in and out of the bladder wall, and then up through the muscle and fascia. A similar stitch is inserted on the other side. When these sutures are tied and cut short the bladder wall is suspended against the abdominal wall in such a manner that the edges of the vesical incision turn inward, forming a valve which much facilitates subsequent healing. This suspension also obliterates the space of Retzius and prevents the accumulation of a pool of urine on the outside of the bladder The drainage tube is now inserted, and one or two chromic sutures inserted in the upper part of the fascial incision These must not, however, close the wound tightly against the dramage tube Sufficient space must be left below it for the escape of blood and urine when the lumen of the tube is occluded with Two silkworm sutures partly close the skin incision, carefully leaving a little room for drainage. One of these sutures is tied around the drainage tube to secure it in place The tube should be of rubber, and 1/2 inch in external diameter, with lateral openings cut near the inner end The very large tubes recommended by some operators are not necessary, and they unduly prolong the convalescence. The proper length is 21/2 to 3 inches The tie with the sain suture prevents the dressing from pressing the end of the tube on the base of the bladder A large pad of absorbent cotton with a single cover of cauze completes the operation

Since abandoning arrigation I have had vastly



ics, trouble with fool bladders than when I used continuous trangation for 24 hours after the operation, and during the after treatment frequent bladder washing. The after treatment has been much simplified. It is only necessary to change the absorbent game pack often enough to absorb the e-saping urne. The had covers may be protected by covering the pad with a square of rubber sheeting. The patient may be out of bed in a wheel chair on the second or third day. The bladder often closes within a few days of the reword of the dranage table. This should, however, he retained at least ten days, as it is not will to force the urner through the vested neck.

which at this time is covered only by granulation thsue, and complete bealing of the cavity from which the pro-tate is removed surely requires longer time. As this is being completed during the third or fourth week, and occasionally at long intervals afterward, it is well to be certain of maintaining a good opening in the vesteal end of the urethra by the occasional passage of a sound as large as the capacity of the urethra will admit without force.

Every step of this composite operation is of importance. Carried out as ilescribed, it constitutes a logical operative procedure with highhe satisfactory results.

THE OPEN FREATMENT OF FRACTURE OF THE FEMUR

BY ALLYIUS MICHANNAN, M. D., BANTIMORE

N a recent discussion of the open teatment of fracture of the shaft of the femur, the strength of the plate and the holding power that the reports. This prominence was shared with studies of the endurance and the resistance of various instruments under strain apparently, study of the mechanical side of the subject had distracted these observers from the important fact that the tumon of a broken hone is a study process, and is governed by the same laws that control wound healing everwhere

Accurate fixation of the fragments is of great importance for the union of a fracture, and the degree of functional recovery is directly proportional to the accuracy of this approximation, but fixation is not the only factor in securing success. There are specimens in every mus-turn like the one shown in Fig. 1, and similar illustrations are found in all works on surgery, examples of the firm healing of bone in the absence of accurate fixation of the fragments

The healing of a wounded bone will be delayed or prevented by undue tension, by imperfect circulation, and by all the other factors that prevent or delay wound healing in general

Therefore it seems to me that success in the open treatmost of fracture of the femur does not follow greater strength of the plate and as five tion, but depends rather on cartfully following the general rules for the treatment of fractures, especially with regard to position of the limb and the application of dressings. The plate is intended to act as an internal sphrit, one whose application on threshop on the bone makes perfect approaching.

possible, but whose action is required only for the length of time necessary for the formation of timicallus. Tension strong enough to break or twist the Harselman silver plate or great enough to toosen properly inverted stress is too great for primary wound healing and will interfere with bony timin excur if the fragments are kept in apposition by some trimer fixation. The original Lane plats, without any reinforcement, is strong enough to hold any fracture if the limb is put in the proper position.

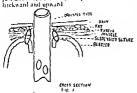
In our recent cases the operation was performed in the manner to be described. The patient is prepared for operation by a period of prelimitary treatment varying from one to ten days, during which turn, the broken lig is either suspended as in lig 2, or is handlaged to a long side splint. All bandways to operation, i.e. heart, lung, kuthey, or digestix, diecases, are studied, and as far as possible compensated or removed by appropriate treatment.

Occasionally some complication is found that probibits any operation, or a condition such as malignant tumor which indicates amputation cratber than an attempt at the cure of the fracture. Syphilis, anaxim, bypothyroidism, and other constitutional deturbances known to interfere with bony union must be searched for, and if found they are contraindications to immediate operation. Individuals, suffering from thee distributional discount or the patients of the condens are always poor surgical risks, and operation for fracture in these patients is sure to end in disaster unless the constitutional disease has been brought under the influence of appropriate treatment. The immediate preparation of the



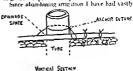
Fig. 1. Rockey's prostatectomy forcers

cland delivered in two nices. I have sometimes superated it only in front to facilitate drawing the large gland through a small invision. The prostate now her free in the Idadilir The glove is then drawn from the left hand, and under the guidance of the left index tinger, the delivers of the loosened prostate is accomplished by a pair of suitable fenestrated forcers Lurmerly 1 used an ordinary springe or tongue forcers Recently, however, I have ilevised a special foreign for this purpose (Fig. 1). It has an or alblule with smooth reigns and a scalloped lencetrum which mill hold the postate without tearing any change lot of the vestal arrows which might be raught in its gripe. By care and a little manufulation a large gland may be quickly th livered through a small incision. The gland is soft and clongstes as it is seized with the forceps, and the bladder wall is elastic enucleation of a large gland requires no langer blathler incision than a small one The room natured for the drivers of the changated glaml from the bladder marks the host of the required incision. In practice I find that in thin subjects a 1 % inch skin incisum and in archnitik fat subjeets a 2-meli meision is about right. In fat men, a distinct advantage in enucleation may be gained by having the assistant place both hands that just above the jucision, and press the bells wall



After the delivery of the gland, the valvular suspension suture (Fig. 2) is introduced. I regard this as a most important step in expediting recovery. The edge of the wound on one side is held back by a small retractor. A Robeson needle threaded with No. 3 catgut is passed through the fascia and muscle. The left index finger is introduced into the cultarsed bladder and hooks it up and brings it into the uponing. The edge of the bladder incision is seized with a toothed hymostat and drawn out until the needle can be readly inserted half or three quartery of an inch from the margin of the incision. The needle then does in and out of the bladder wall. and then un through the muscle and fa-cia, A similar stitch is inserted on the other side. When these surures are tied and cut short the bladder wall is suspended against the abdominal wall in such a manner that the edges of the vesical incision turn inward, forming a valve which much facilitates subsequent healing. This suspension also obliterates the space of Retzius and prevents the accumulation of a pool of urine on the outside of the blukler. The drainage tube is now inserted, and one or two chromic sutures inserted in the upper part of the fascial incision. These must not however close the wound tightly against the desinage tube Sufficient space most be left below at for the escape of blood and unne when the lumin of the tube is recluded with I an alknown ansures methy close the skin incision, carefully leaving a little room for dramage. One of these sutures is tied around the drainger tube to secure it in place. The tube should be of rubber, and '2 inch in extirnal diameter, with lateral openings out near the inner The very large tubes recommended by some operators are not necessary, and they unduly prolong the convale-cence. The proper length is 23, to 3 inches The tie with the skin suture presents the thressing from pressing the end of the tube on the base of the bladder. A large pail of absorbent cotton with a single cover

of gauze completes the aperation



employing the smallest amount of force, therefore the resulting degree of shock is less than when other forms of traction are used

The weight of the body furnishes sufficient counter traction in recent fractures. When dealing with an old fracture we fix the limb by means of a rope of gauze passed over the groun and under the thigh, and tied to one leg of the

operating table

The reduction. While the traction and maimpulation are carried on, the upper fragment may be held in a lone-jaw forceps, and further may be held in a lone-jaw forceps, and further may be a lone of the lateral states of the Laine femur elevator or an ordinary periosital relevator. Sometimes all of these instruments are used at once, with the ail of a competent as-istant. If possible the fragments are now held in a Lowman or some small to bone champ, or else the lon-jaw and other instruments are still kept in place until the plate is fixed.

In all these maneuvers especial care must be given to the preservation of the periodeum. This membrane is the source of the greater part of the new bone that makes parfect healing of the fracture. It should neither be stripped from the fragments nor volently torn or crushed by the claims and other instruments.

The plate and its hyation The length of the plate must vary with the character and position of the fracture. We aim to use a plate long enough to have the screws inserted at least 2 cm from the edge of the fracture \s a rule, one screw in each fragment is sufficient, but when the fragments show a tendency to rotate, two screws should be put in one (ragment if not in both The length of the screw, will vary with the object of their insertion. When the cortex of the bone is of normal density and thickness, it is liest to use a short screw, one that penetrates the entire thickness of the cortex after passing through the plate. When the cortex is thin or less compact than normal, a screw longer than the diameter of the medullary cavity should be used in order to obtain greater strength of fixation by pencirating the cortex on the opposite side

The relative advantage of the silver or steel plate is open to discussion. The rightly of the steel plate is off read value in preventing bending or twisting movements of the fragments during the application of the external fivation dressing. Long experience has made surgeons look with favor on silver as the best metal to be buried in the tissue. The anticeptic action of the metal in colloidal solution more than balances the advantage of iron, that is, a metal whose salts are normal constituents of the body.



Lig. 3. to show the direct traction on the lower fragment. The long drill transities the femur near the conducts and the rope of gauge passes over the front of the thigh and tround the ends of the drill.

Our own results have been citually good with both forms of plates, although we have hait more experience with silver. The great advantage of sted over giver plates seems to lie in the fact that in the former a smaller weight and volume of metal is necessary to obtain the same degree of feation.

Chaine of the sound All hemorrhage from the soft parts must be controlled before the wound is closed. Some ozeing from the lone will persist, but if the wound is otherwise dry the tester will take care of this. Torn perusteum is first replaced and sutured to similar days or undurentable musted surfaces. Muscles are coupted and the fascia carefully sutured. Catent is the best material for these deep sutures. The ends of these categot sutures are left long and brought out through the skin in order to afford drainage for any ozing in the wound. The skin is closed with a subcellageous when your

The dressing. The wound is dressed with a septic gaure, and the himb padded with sterile material. Over this an ordinary brinding is quickly applied, in the turns of which a number of thin strips of splint wood are incorporated, for the purpose of equalising pressure and aiding

the circulation Then a plaster of Pans cast is put on, running from the toes to the nipple line This cast is moulded well around the knee and over the pelvisandhip. Asuspension apparatus or

432

support, or a special table like that of Dr Downey
will be found useful in applying the cast

The position of the limb in this dressing depends on the site of the freature "The limb is placed in that position which inclines the fractured portions nearest a normal line, and most effectually relaxes the muscles of the limb "2 When the fracture is in the upper third of the bone, the thigh and leg are partially fleveil and the thigh slightly abducted With a fracture of the middle third, the limb is put up straight When the bone is broken in the lower third the knee is hall fleved and the hip is flevel enough to bring the heel and the sacrum on the sume homzontal plane when the rattent hes on his back

Affar ear. The dresting is not disturbed for three weeks, unless the wound demands attention before this time. In the latter exait, a window is cut in the plaster and the wound inspected and dressed through this opening. After three weeks the cast is gradually cut away from above and below until at the suth week there remains only a cast extending from the pelvis to the knee After eight weeks the knee is freed, and all fixation is removed at end of ten weeks. During last four weeks the patient may be about on crutches

We give five grains of thyroid extract once a

give iron and calcium the succeeding four weeks. As soon as any portion of the cast is cut away, the exposed parts are massaged daily and any free joints given passive motion. With children or thin adults it is better to remove the entire cast after the third week and apply a new one, after giving the limb passive motion and massage. This dressing and manipultion is repeated

every two weeks until the tenth week.

Results. Our results have been uniformly successful as to permanent cure and function.

In one case a large harmatoma developed in the wound and required evacuation, delaying the healing of the soft part wound. We have had

no fafections nor any case of non-union Telerance of the issues for the plates. We have not removed the plate in any of our cases. This has been the result with most operators in cases of fracture of the femur. With the more superficial bones, as the this or una, etc., the plates are more hiely to require removal. In a series of 20 plated fractures of 20 blones we have been compelled to remove the plates in two cases—one from the thus and the other from the office of the plates of the plates in the case of the plates of the plates in the case from the thus and the other from the office of the plates of the plates in the depth of its position in the tissues the turther from the skin it is placed, the greater the case with which the tissues accommodate themselves to 11s presence.

Note -Since writing this report we have removed a Lane place from the thigh on account of sinuses three months after the original operation

AMPUTATION FLAPS

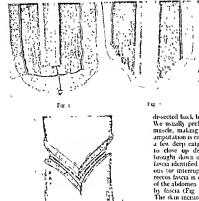
BY JABEZ N. JACKSON, A M M D, KANSAS CITY, MISSOURI

THE flap of an amputation in the extremiters as described in all our works on surgery, down to during the described listen. The slap has deep fascil a relationary to the slave and the slave and the slave and the slave and the slave flat of the sl

about the bone are divided comparatively high or later contract and retract, the end of the bone is showed forward, covered only by superficial fascia and skin, and a conical stump results (Fig 2). Ofttimes even the superficial fatis absorbed and the skin is practically tight over the end of

Again retraction takes place in the center over the bone (Fig. 3), and we have a fossa accumulating dart and engendering infection and irritation. Such stumps often give trouble They are never anatomical.

To meet this criticism we have for nearly ten years employed the following plan Flap fashioned as preferred, the incision is carried down through skin and superficial fascia to deep mus-



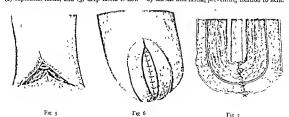
Tig 4

cular fascia. Allowing ordinary skin retraction
the deep or muscular fascia is incised in same line
(Fig. 4). The flap consisting now of (1) skin,
(2) superficial fascia, and (3) deep fascia is now

dissected back by cutting into muscle substance. We usually prefer to cut obliquely through the muscle, making a contact flap (Fig. 5). After amputation is completed and hamiostasis secured, a few deep catgut situres approximate muscles to close up dead space. The flaps are now brought down over the end of stump, the deep fascia identified and sutured (Fig. 6) by continuous for interrupted catgut stitch—just as the rectus fascia is closed in the modern tier closure of the abdome. This covers all raw muscle ends by fascia (Fig. 7) as nature originally planned. The sku mission is now closed by separate line, using whatever suture method or material one mas elect.

Fig 3

Idiattages (t) Anatomical, muscle covered by deep fascia, skin separate and movable. (2) No retraction of skin and formation of creases or fosæ for dirt. (3) Fascia holding muscles uniformly over end of stump (4) Bone covered by muscle and fascia, preventing fixation to skin.



THE AMERICAN COLLEGE OF SURGLONS

At the New York meeting of the Clinical Congress of Surgeons of North America in November 1912, Franklin H Martin asked that a committee be authorized by the Congress to consider the advisability and practicability of establishing a strong continental association of surgeons to be known as the American College of Surgeons the object of which should be to elevate the standard of surgery on the American continent and to grant a followship in such an organization which would indicate that the processor of such followship in the opinion of his peers was thoroughly qualified to practice surgery

THE COMMITTEE

Such a committee with full power to act delegated to it was appointed by the President of the Congress. Librard Martin on Philadelphia. The committee appointed of which the President is a member expolicio is thoroughly representative and consists of Librard Martin Philadelphia Limitet Rivord San Francisco John B. Murphy. Chicago Rudolph Matas New Orleins. Milert J. Ochsier, Chicago Charles H. Mayo. Rochester Minn. L. J. Cutton. Boston, George Lineson Brewer, New York, John M. T. Limites, B. Ethiron, W. W. Chipman, Moutreal. George W. Crile Cleveland, and Frankin H. Martin Chicago.

PARTIMINARY PLAN TOR ORGANIZATION

Immediately after the adjournment of the Chincal Congress on Blindscharter was inframed which secured to the organization the kg d right teethmane of American College of Surgeous. The applie into the thirterwere Murphs. Ochsider and I. Martin. The members of the provisional Corporation are Brewer. L. Martin, Murphs. Ochsider and I. Martin.

The present plan or organization, which of necessity is provisional subject becommination by the corporation when organized is a follows:

CORPORATION OR COLLEGE

The founders of the Corporation shall be selected from all departments of surgers in the recognized methical colleges. Joth graduate and undergroduate of the United States and Canada, and such other surgeons as the origination committee may designate.

BOOKED OF GOVERNORS

An executive committee of fifteen or more should be elected by the Corporation at its first meeting and provision made whereby they may be disided inteclesses with terms of service terminating more two and three years as their successors are selected. This executive committee it has been suggested should be known as the Board of Governors and their districts shill be similar to those usually performed by a board of tristees.

TTLLOWS

The Fellows shall consist of (a) the several thousand surgeons of whose standard of surgeonship there is no doubt and who have been or are now practicing surgery; (b) other medical men, who are graduates in medicine, and who will qualify themselves according to the organization requirements; (c) younger graduates in medicine who through supplementary work furnished by their own schools or graduate schools, have met the requirements of the organization — The fellowships are to be conferred from time to time by the Corporation on recommendation of the Board of Governors

PRESENT PLANS

It was proposed by the organization committee that it should proceed at once, through its Chairman and Secretary in co-operation with members of the committee in the separate localities to inside by means of conference and correspondence the members of the original Corporation and to arrange for a preliminary meeting of the Corporation in Washington on May 5, 1913, the day preceding the meeting of the American Congress of Physicians and Surgeons, at which time the original committee will recommend a plan of organization to this large foundation body. This meeting will then effect a permanent organization to

WHAT HAS BEEN ACCOMPLISHED

During the week of January 20 in pursuance of the above plan, the Secretary of the Committee Franklin II Martin, made a preliminary canvass of the eastern seaboard cities. Meetings had been arranged in advance by the local committees, to which were invited the heads of departments of ourgery in the medical colleges and other leading surgeons in each of the following cities. Washington, Baltumore, Philadelphia, New York, Brooklyn and Boston. Subsequently Toronto, Montreal and Cleveland were visited, where similar meetings were held. On March 6 a similar meeting was held in Los Angeles and immediately following this was a series of meetings, including San Franti-co, Portland. Seattle. Vancouver, Winnipeg, Minneapolis, St. Paul. Kansas City, and St. Lous. The other important cities of the United States will be canwased during the next four weeks.

In each city the preliminary plans of the committee were outlined and a free discussion was invited and obtained. Every man attending the respective meetings was given an opportunity to formally declare his willingness to accept an invitation to become one of the founders of the Corporation of the American College of Surgeons, and to be present at the meeting for organization which will be held in Washington at the New Willard Hotel on the evening of May 5 1913

This preliminary canvass has resulted in more than 350 of the leading surgeons of the United States and Canada declaring themselves ready to accept invitations to become foundation members of the Corporation It is the intention of the committee to pursue this plan of visiting personally, where possible, all the college and university cities of importance in the United States and Canada, and of obtaining in this carteful manner a list of five hundred of the leading surgeons from all sections of the continent who will come together and consider the best ways and means of accomplasing the ends for which the committee was appointed, and to form themselves into a governing body of such strength and influence that their authority will be unquestioned

With this strong corporate body of leading surgeons of the continent and with a fellowship of several thousand surgeons of whose ability there is no doubt, it will be an easy matter to establish a minimum requirement for beginners in surgery that will be welcomed and executed by the worthy educational methcal institutions now in existence. When the requirements have been fulfilled, either by the beginner in a supplementary course in hospital and operative work, given by the school from which he receives his medical degree or by the older practitioner who takes a supplementary postgraduate course from a distinct graduate school, he will be made a Fellow of the College.

With a powerful fraternal body like this working in perfect harmony and co-operation with all the educational institutions on the continent, the matter of still further increasing the influence of the Corporation through congressional, parliamentary, state or provincial legislation will be entirely a matter for the Corporation to decide

First, secure an organization backed by the best surgeons in the United States and Canada as governing members, through this develop public opinion in the laits and the medical profession for a higher standard of surgery, and then ask for the legal machinery that will bring about reforms that are not already controlled by the influence of the rice public outside.

SEMMINE OF THEM'S

The following ideas and suggestions as regards the organization were brought out at the meetings in Washington, Baltimore, Philadelphic, New York, Brooklyn, Boston, Toronto, Montreal, Los Angeles San Francisco, Portland Seattle, Vancouver, Winnipeg, St. Paul, Alimicapolis, Kanasa City and St. Louis

The organization must be independent of all societies, all congresses, all

universities or schools"

2 'While independent, its governing body must consist of the leading surgeons in all departments of surgery from all the leading general and special societies and the accented teaching bodies.

3. With a central controlling corporation of this kind, its strength and influence will be such that its motives, cannot be questioned, its relings will be authoritative, its fellow-hips, will be sought for and its influence will be respected.

4 "The granting of its fellowships should be open to all competitors in surgery, without favor Scientific attainments measured by the Corporation's standard and backed by unquestioned moral character should constitute the requirements of a fellowship."

5 "There should be four classes from which the Fellows should be selected

at the beginning
(a) A large group of surgeous of sufficient reputation and attainment in
surgery, of whose surgeous hip there is no question, who should be carefully selected
by the Corporation and invited to become Fellows without formal examination

(b) Men who are not of sufficient reputation to receive an invitation under

(a), but who may apply for fellowship They should he passed upon by examina-

tion or otherwise by committees on Examination and Credentials.

(c) Recent graduates in medicine, of sufficient age, who are desirous of fellowship and who apply for admission to fellowship. Of these, those who can produce advanced credits recognized by the organization which are furnished by medical schools also recognized by the organization, and give satisfactory evidence that they have been in the practice of medicine a sufficient length of time, are to be received without examination.

(d) All other recent graduates, viz, those graduating from schools not giving the satisfactory advanced course in surgery required by the organization must give satisfactory evidence to the committee on Credentials of practical work done

and submit to an examination."

"The organization should he inclusive and not exclusive in its methods.
 should be a popular democracy with a membership based upon efficiency, rather than an exclusive aristocracy based upon position."

7. "The principal object of the College should be to elevate the standard of surgery by utilizing to its maximum the machinery of the existing teaching institutions in order that our prospective Fellows can obtain training without undue hardshin."

8. "We must urge all surgeons of prominence to hecome Fellows in order to magnify the importance of the College to the unknown man, and thus induce him

to qualify in surgery and seek its stamp of approval "

- o. "The ceremonies of the College in the granting of fellowships should be of an impressive and dignified nature in order to increase its prestige with the profession and the laity. Convocations should be held in the spring and fall, when scientific or educational addresses should be delivered by foreign or local surgeons of note, when prizes should be awarded, as the College in time establishes such prizes through endowment or income, and when the fellowships should be granted by the President of the College under the direction of the local members of the Cornoration"
- io. "A Blue Book in the form of a directory should be published each year which will give the names by states and cities and the addresses of all Fellows. This should be on the desl of each Fellow to be used as a guide in recognizing the men of approved qualifications in each state and province on the continent." It "The finances of the Corporation should be independent. A fellowship.

fee of \$10.00 should be required. No annual dues should be necessary, because of the fellowship fees to he paid by new members each year, except it be a \$2.00 fee for an annual directory."

12. "As the Corporation will bring its influence to bear hy co-operating with

the medical schools and societies now in existence, and as the medical schools are all properly chartered under state and provincial laws, and as there is not as yet a national corporation law, the only charter that this Corporation will require is

one under a state law, under the act 'not for pecuniary gain ""

13 "As this organization contemplates a Continental plan rather than an exclusive United States plan, it has been suggested that the name be 'North American College of Surgeons' or 'American College of Surgeons' with a suffix '(U.S.),' '(Canada)' or '(Mexico),' or with a graduate college designation, as 'American College of Surgeons, (McGull), '(Harvard),' (Johns Hopkins),' etc.'

14. "As public opinion is more potent in influencing the public than the strongest laws, this great fraternal body should bring its influence to bear upon the profession and laity through the creating and maintaining of proper public opinion"

TRANSACTIONS OF SOCIETIES

CHICAGO SURGICAL SOCIETY

REGULAR METTING HELD DECEMBER 6, 1912, WITH THE PRESIDENT, DR. CHARLES DAVISON, IN THE CHAIR

A SYMPOSIUM: CLASSIFYING AND STANDARDIZING SURGICAL PRACTICE

- A METHOD OF CLASSIFYING AND STANDARDIZING SURGICAL FRACTICE. BY ALLEN B. KANAVEL, M.D.
 THE POST-GRADUATE PREPARATION AND LIGAL RECISTRATION OF THE SURGION BY CHARLES
 DAVISON, M.D.
- THE NEED OF PROFESSIONAL AND LEGAL REGULATION IN THE PRACTICE OF SURGERY. BY COLEMAN G BUTORD, M D

A METHOD OF CLASSIFYING AND STANDARDIZING SURGICAL PRACTICE By ALLEN B KANAVEL, M D, CHICAGO

ThL surgical skill of Mott, McDowell, Sims, Gross, and our own Senti and Fenger, with scores of others, has made American surgery respected wherever surgery is practiced. These men, however, were the exceptional practitioners who by industry and study gained a mastery, and were recognized as especially qualified above their fellows to practice that branch of our science.

In this later day, the whole plan of education has changed The medical schools have elevated their general standard, without in like manner raising the requirements for surgery Our students all receive the rudiments of surgical knowledge, and are led to believe that in a fouryear course they have had the training it took our Motts and Senns a score of years to acquire by closest application. The technique of surgery is mistaken for the science of surgery student of medicine must now actually percuss, palpate, and auscultate, he must himself examine the secretions and excretions, he must actually take part in obstetrical deliveries. But the surgical student may still go out and practice this branch with only a dissecting knowledge of anatomy, a post-mortem knowledge of pathology, and a theoretical knowledge of the mechanics of surpery We, as teachers, give our diplomas and

tacit recommendation to graduates, saying this they are qualified to practice surgery, when they have never actually held a surgical scalpel, when they do not know the feel of an engorged appendix and when their only knowledge of an infiamed gall-bladder comes from the description of an operator

The fault is not that of the student when he attempts surgery. It is ours that ne do not set some standard by which both he and the public may know that he is qualified to practice. Therefore, it would seem that we as surgeons should.

First Outline by what methods and in what manner the student may become properly equipped to practice surgery Second Designate what qualifications the etudent

Should have before we recommend him as competent
Third Formulate some method by which the public
may learn who is considered so qualified

Should this be done by legal restrictions or by education of the profession and the public? This is a legitimate question for discussion. Against seeking a method by law, it may be urged that the endeas or nould be misunderstood, and improper notions impatted by both the promotion of the property of t

public and professional education which would compel the surgeon to equip himself so that be might practice with safety to his patient and credit to himself? To do this, the following plan may be suggested as a working basis.

A committee may be appointed by this body to confer with other organized surgical bodies and medical schools upon the following prop-

ositions.
First. What education should be necessary

for a surgeon?

Second Should a special honorary degree be

awarded which would stamp the holder as qualified to practice surgery? This committee should have the broadest of

Inis committee should have the bloodes of instructions and be asked to convey to us at a later date the result of this investigation

The standard requirement may be worked out

along the line of the number of years the physican has practiced, his various assistantiships to surgeons, interneships, and special study. The fellowship should be granted by a central committee made up of the recognized men from all recognized surgical organizations, this commuttee froming itself into a college for that purpose This group then may grant a fellowship upon investigation, examination, or recommendation

by recognized surgical organizations or medical

The individual having this degree is thus stamped before his fellows and the world as one qualified to practice. It is my personal opinion that the force of this would be greater if, upon receiving this fellowship, the recipient would be required to drop the appellation of doctor and be known after the English custom as "Mister," followed by the letters signifying his fellowship. Thus the man who wishes to practice surgery as a specialty must cease to advertise himself as a physician, although he would not by law be prohibited from treating medical cases, and, conversely, the man who wishes to continue in active medical practice would not apply for the degree, and hence could not advertise himself as a surgeon, although there would be no legal bar to his practice of surgery A general knowledge of these facts would soon enable the public to distinguish between the specialties, and force each man to choose for himself whether he wished to be known as a physician or a surgeon. If the latter, he would realize the value of properly equipping himself and attaining the degree which would be evidence to the public of his competency

THE POST-GRADUATE PREPARATION AND LEGAL REGISTRATION OF THE SURGEON

By CHARLES DAVISON, M. D., CHICAGO

THE practice of surgery has grown so rapidly in the last few years that its relationship to the community is not on a stable basis. The practice of surgery as a specialty has been singling itself out from the other branches of medicine in a remarkable manner.

The achievements of good surgery are so brilllant, the results so satisfactory, and the emoluments reputed to be so rich, that it presents a field intensely alluring, allk to the ambitious and reckless novice, to the mercenary and unscrupulous general practitioner, and to the smooth and polished surgical exploiter, who performs unnecessary operations to obtain the fee, who makes his living by bumbugging and defrauding credulous and suffering humanity

Unskilled and ill-judged attempts at the practice of surgery lower the prestige of surgery and the prestige of every reputable surgeon within the radius of its publicity Unskilled and ill-judged operations give poor results, and those of the laity who are familiar with individual bad results are slow to avail themselves of surgery, even when it is necessary, when it is health-gaying, when it is life-taving.

The laity has seen its friends and relatives, suffering with trivial diseases, die under the knife of the novice or incompetent, and shudders with apprehension at the mention of surgery

Every unnecessary operation, every ill-judged operation, every badly executed operation, every operation followed by bad results, casts a certain amount of odom on good surgery and limits the usefulness of capable surgeons, both to themselves and to their fellow-men. There are many faults in the practice of surgery, some lying at our door, some outside of our ability to control.

It seems that it is time for us to take an inventory and find where we stand.

It is a common thing for a man to graduate

from a medical college, enthused with his theoretical knowledge of surgery, enthused with his ambition to imitate his surgical clinical teachers. anxious to rival his previous classmates, anxious to make good in his profession, but without practical surgical training

He has seen many operations from the benches. He may have stood by the patient during an operation a few times, capped, gowned and important, but as a student he has probably never reached the stage of personal sterile preparation for an operation He has never had his hand in

the field of a capital operation

That young graduate, backed up with a diploma from one of our first universities, but with that lack of experience, may be the one to go out and nose before the public at once as an accomplished surgeon

He may be ready to operate upon the first surgical case that he can land, no matter how

serious or vital the operation may be

If it is an important abdominal operation, it is the more alluring to him flis mistakes in judg. ment or technique are covered by a kindly peritoneum or the grave. This man has a legal right to do surgical operations of any kind as soon as he has passed his examination and has been licensed to practice medicine and surgers by the hourd of health in the state in which he resides He can obtain this legal right to do surgical operations although he may never actually have done a surgical operation in his life, although he may never have been the actual assistant of a recognized surgeon for a single day file can obtain this license to practice surgery without having been an assistant to any surgeon or interne in any hospital of any kind lle can obtain this license to practice surgery without practical experience of any kind These things are possible with the recent graduates of our best universities

The recent graduates of some of the medical schools of lower grade, where the preliminary educational requirements are a farce and the professional course is weak, are entitled to the same legal privileges as their more theoretically

proficient brothers

It is the general practitioner without surgical reading, training, or experience who is the greatest

offender.

It is the family doctor who is successful as a general medical practitioner and who knows little of surgery, who does one, two, or three operations a year-it is he who is doing the damage to the reputation of surgery

The damage is great, because there are so many of this class of offenders, each doing a little The family doctor has the confidence of his patients. He is intrenched by his medical successes with them, by his long acquaintance with the family. and by his experience in dealing with people, The influence of the lamily doctor decides who shall be the surgical operator in the majority of CISCS.

The family doctor, according to his own ideas and inclinations, can refer the case either to a competent operator, appropriate to the case, or he can make the attempt to operate on his patient himself, or he can divide the responsibility with some brother practitioner of equal ability but more audacity. The patient will usually approve ol either disposal

It is a matter of common knowledge that groups of lamily doctors are doing elective capital surgery in a mediocre manner in kitchens in small towns and rural districts all over the country, with varying results. The had results are charged by the laity to surgery as a whole, not to individual incompetent attempts at surgery, which these results represent.

The ho-jutal, modern and well equipped in all its departments, furnishes the most glaring examples of the surgery of the family doctor. The competition of hospitals for patients is so great that any general practitioner of good standing in the community may bring his patients to almost any hospital and operate on them himself, with good assistants, good equipment, and good surroundings, on some patients with success, on some with failure

In occasional cases the friends of the patient remain in the reception room while the family doctor operates, with the assistance and co-operation of the interne, that is the interne with a few months' experience does the nork, with the exception possibly of the initial incision, while the family doctor looks wise, and holds a bloody sponge, and later shows the surgical relics to admigne friends of the patient

In other hospital cases the general practitioner operates personally on his cases, but does it in such a tedious and clumsy manner that the nationt becomes exhausted before the operation is complete

For example, a patient apparently in robust health, a woman in early life, the mother of a family, walks into a hospital to be operated upon for prelapse of the uterus, a resultant of childbirth Her family doctor - the doctor who brought her babies into the world, the man in

whom she has confidence - operates upon her for three hours and forty five minutes! She lives fifteen minutes after being returned to her bed.

The operating surgeon should be equipped by proper experience and proper training before he begins his career as an independent operator.

begins his career as an independent operator.

He should serve an interneship in a general

hospital.

He should have done general medical practice for a sufficient time to establish good judgment in diagnosis, and to learn what the human body will stand when in trouble from disease.

He should have been an active assistant for a good length of time to some surgeon of established ability and practice, or else he should have been trained as a surgeon by post-graduate study and active operative experience in a hospital especially equipped for that kind of service, with the active supervision of a competent surgical teacher for a length of time sufficient to establish surgical judgment, operative technique, and manual dexterity.

Surgeons who have bad these kinds of training and experience should be marked out from the general profession and labeled in such a manner that the common people can distinguish them as competent and safe operators.

This may be accomplished along two lines:

by education and by law.

The conferring of appropriate degrees by the graduate

1 An countering or appropriate degrees by the graduate schools of the universities that conduct 'A grade' medical schools. This could be made effective if the standard universities would put into their graduate schools the proper course of instruction for the surgical education of students who sere already graduates in medicine— if the universities would train these men in the hospitals under university uppertivion until the establishment of actual operative proficiency, and then grant a diploma from the graduate school of the university, conferring a distinctive surrical degree

This course should be of sufficient grade in time and character so that the surgical degree would equal in prestage the other doctorate degrees given in course in the graduate schools of the different universities. When this has been done our ideals will have been accomplished.

2 The legal registration and ticensing of surgeons and their supervision by state boards of health.

units supervision by state coards of health.
This could be made effective if the medical practice
acts of the different states could be amended so as to give
the state boards of health the power to license doctors of
medicine to practice operative surgery when they had
aroughtly prepared themselves by post-graduate work and

especience

R is suggested that this preparation shall convist of
(a) how years of general medical practice, (b) five years of
(a) how years of general medical practice, (b) five years of
interine in a general hospital, (c) service as assistant to a
surgoon of the staff of a general hospital, (c) service as assistant
surgoon on the staff of a general hospital, (c) service as assistant
surgoon on the staff of a general hospital, (c) service as assistant
surgoon on the staff of a general hospital (c) service
is an any standard institution, greatly by recognized by state
boards of health, (6) the five years of surgical especience
may overlapt the five years of general practice

The primary registration would necessarily exempt from these requirements all medical men

already doing operative surgery.

First attention to emergency surgery would necessarily be exempted from the operation of any law

When the operating surgeon is labeled by a university surgical degree and licensed by the state board of health, the faity will have a guide in selecting the surgeon, and there will be an improvement in the end results of surgery.

THE NEED OF PROFESSIONAL AND LEGAL REGULATION IN THE PRACTICE OF SURGERY

BY COLEMAN G BUFORD, M D CHICAGO

NERV profession has its defects in qualifying its members, as well as its incompenents. The pulpit is filled with those theology, eloquence and rhetoric are not attracting attendance, the har shows frequent camples of the loss of just causes through lack of elementary knowledge of court procedure. I believe that the profession of medicine is doing wastly more than any other profession to improve the quality of its recruits and its members, and further believe that careful review of those leaving academic work and entering the various professions and pursuits will show the bighest per-centage of professions and finest examples of

manhood and womanhood among those entering upon a medical career.

In the performance of the world's work, each profession and pursuit and each highly specialized branch of either must be depended upon to find its own defects, and to purify and perfect itself in the interest of common welfare. Prompted only these high motives, this highly specialized body has assembled to discuss ways and means of hetter preparing the surgeons and better regulating the doing of surgery by those who are to follow, in the interest of common good.

It is so apparent to surgeons themselves that their special branch of medicine needs some professional and legal regulation that it seems almost superfluous to discuss the subject here; superfluot to discuss the subject here; strangthing is to be accomplished in the way of legalizing practice by the fix and probibiting the practice of major surgery by the unfit, it is necessary for this question to take form, to thus afford opportunity for discussing it, and through such discussions promote the formulation and enactment of just laws directed toward the end we have in level.

The present laxity is due to social conditions existing in every new country, defects in medical education, the open hospital, loose methods of making hospital appointments, management of hospitals by untrained superintendents, and

deficient legal control of hospitals themselves Medical education has received severe criticism in the last few years, and while I sanction this criticism and believe it will result in the most rapid improvement in our educational system. I also believe the system of the past will bear the last analysis without any great reflection being thrown upon our profession, for it must be remembered that in our country the lasty have not borne their part of the bueden of maintenance of medical schools until recent years. Both the work and the expense have been largely borne by the profession Turthermore, in this new country of wide expanse, physicians were required to follow upon the trail of settlements bound ever westward Because of the great distances to be covered by physicians in each locality, the work of each was arduous and limited, and in order that a sufficient number might be produced willing to follow upon the westward trail, there was a natural demand for more medical schools, usually poorly equipped, resulting in an overabundance of medical men remaining in the more eastern centers. We are destined to go on with this apparent overproduction to fill the gaps in the Orient which is now opening up to civilization, though we send them poor doctors, they are better than no doctors at all

On account of the duranishing frequency of disease, shortness of illnesses, the greater uniformity of settlement of our own country, and the improvement in transportation facilities, the field of usefulness of each practitioner has been increased and the local demand satisfied, already though than naturally utrined from that of production of numbers to that of quality. At the right time this question will automatically adjust itself

The past system of medical education in America may be justified by the theory that nothing evists without need for it, and the present efforts at revolutionizing medical education may be similarly justified by the theory that nothing remains when use for it ceases. Medical education has been and will continue to be, in a sense, a national industry, developing spontaneously and sporadically. It has been the custom of our country to take little notice of any of its infant industries, but upon nearing their maturity to regulate them. Medical education has begun to fed this influence, and, as the result of legislation, is beginning to assume a selective role in the choice of those who may even enter upon the study of medicine, with a view of producing the best brand of doctors

The educational qualifications of medical men of earch decade has perhaps ben equal to those of other professions of their time. The finding of inferior men in any field does not necessarily mean they were originally poorly qualified, for their environment and finters for the strength have had largely to do with the final product. Though we clueate all of our men in the first lashion, and enactivery conceivable law, therewill remain in the final shadeons those who, as the men goes on and civilization and knowledge advance, will be relataryly as poor practitioners of medicine and surgers as there were in the days of our forefathers.

Up to thirty years ago the field of surgical possibilities was rather limited. The surgical's work was largely done by the phy setan, who dealt with accidents and, surgically, with comparative by few other diseases or conditions. On account of the rapid development of pathology, improvement in our diagnostic ability, and the advent of antisques and assepsis, one affliction depretaines surgery. The scope of surgery has so increased that one must be specially trained in diagnosts, technique, detertity, temperament, judgment, and conscientiousness to give the uniformly good service systeried of him.

uniformly good extra expected of him. The present generation has had a more extensive surgical training in whool than their predecessor. Their instruction has consisted of disactic lectures, operative surgery on the cadaver and on animaly, and clinical instruction. Disactic lectures have rarely covered the entire field of surgery, because of lack, of allotted time, the instruction on the cadaver has not been uniform in the different schools, because of the irregularity of requirements and of material. The quarters allotted to this department have often been unsanitary and cold, and the material often yand poorly preserved, thus not encouraging careful study. The student dealt with normal structures, instead of almoraml as met at the

operating table. Work on animals has been limited in amount, and has had to do largely with visceral surgery, the broad field remaining which could have been taken up in classwork is hardly comparable to human surgery. Most surgical clinics have been small, with great irregularity in the amount of material. This has been due largely to poor departmental organization school has boasted more of its numerous professors of surgery and numerous surgical clinics than of their quality. This custom has divided institutional approhation, and thus divided the clinical material returning to the teaching body, but it is rapidly giving place to that of better organization, with one head of the department, and I hope soon to see this more general I hope also to see the return of the half-day chief surgical clinic instead of that of two hours. The half-day clinic alone affords adequate time for a really instructive clinical lecture, a creditable number of operations, exhibition of patients previously operated upon to illustrate post-operative courses and after care, presentation of non-operative patients, and gross and microscopic specimens. The field of surgery is so broad, and symptoms and procedure so variable under differing conditions, and the number of hours in which a student may attend surgical elinics are so few, that a wealth of material should be presented The full half-day chnic offers the best solution for economizing the time of the students by doing away with the great losses of time in shifting from one clinic to another. whether in the same place or not, and the eentralization of clinical teaching tends to avoid duplication of clinical lectures, which has heretofore been one of the greatest sources of waste of the time of students The entire chuical organization should be so perfect that the chief clinic would he first supplied with abundance of teaching material

Civil operative surgery is performed in private homes, hospitals, dispensaries, and at such places as emergency demands. The home operation is rapidly ceasing to be insisted upon by patients and their friends, because of a better knowledge on their part of the greater safety afforded in the hospital.

Those engaged in doing civil surgery are: general practitioners, contract and civil employes, trained surgeons who have no institutional connection, and those who have

The preparations from which those doing surgery develop are: Recent graduates without experience as interne or assistant, recent graduates with experience as interne or assistant or both, very long assistantships, post-graduate

study with or without previous interne or assistantships, recruits from emergency services, those who bate gradually grown into surgery while doing general practice, and those who have concluded after some years of general practice to do their own surgery and that of others if permitted.

The recent graduate without an interne or assistantship is not qualified to undertale very much of major surgery. He is not sufficiently familiar with the identity of normal structures, and can rarely deal with the pathologic with intelligence. He is too cager to operate. On account of changing conditions be should hence forth not be legalized to practice major surgery.

Recent graduates having had interne or assistantships are usually qualified to undertake most surgical work at the completion of their services. They should avoid, for their own good as well as the patients, all very difficult or complicated work about which they know little or in which they have had no experience. Those who have served extensively under qualified men are so trained in good judgment and conscientiousness that they are quite willing to have a more experienced person operate for them, or with them, or to operate under supervision This class of men can be trusted. But it must be remembered that a mere interne or assistantship does not in itself qualify Who is the candidate for the title of surgeon? What his alma mater? Who his teacher? What was his hospital? What was his time of general as well as surgical service? What was the volume of work in which he took part? Who his chief? These will better tend to settle the question of his efficiency

Interneships followed by long assistantships unquestionably develop the most efficient surgeons. Medical visitation and post-graduate work are relatively more beneficial to this type of men than to those less trained.

Of those who attempt to become surgeons brough post-graduate study without either interne or assistantship, a very small percentage arrive. I has either faither into the peause the student observes at long range—he sess poorly, feels nothing, and is not forced into activity, judgment, and forethought. He is not co-operate in the after care. Post-graduate courses of a few weeks or even a few months should not entitle men to misleading certificates of proficiency, and though middly worded, as they hang on the wall, most such certificates are misleading.

Recruits from civil and other emergency services without previous interne or assistantships are usually trained in their branch only, which Not one of us

forms a small part of private surgical practice. Past generations have shown many examples of good surgeons gradually developing while doing general practice; special emphases should be put upon the gradual. This type of men did good surgery for their time, but with the field ever broadening and the tendency of the times calling for apprenticeship in every held of labor, I doubt it coming generations will show as many such examples. The time required for attending to practice, perfecting technique, doing research work, and keeping pace with the literature will overwhelm birn who does not start with one putpose and one work.

The general practitioner who after some years of practice suddenly undertakes to do his own major surgery may occasionally succeed in becoming a safe surgeon, but this will be very rare. This type of operator is usually dangerous to his

friends and patients.

It must be admitted that at present surgery
may be done by anyone legalized to practice
medicine and surgery by the state. This work
is undertaken by those not qualified to do major
surgery, by those who are capable and safe lab
but complicated, unusual, and serious afflictions,
and by trained surgeons.

The factors tending to bring about the undertaking of major surgery by those who are unqualified are.

- The pupil niten unfitted by fack of education or tem perament to enter upon the study or practice of any branch of medicine
- 2 The poorly enumped medical school 3. Unqualified teachers who often, through the owner ship of stock or through social or professional influence, hold positions others could better fill. Such teachers and not liable to exert the best and most refining influence axec pupils. This type is rapidly prissing.
- 4 The division of responsibility for surgical instruction, the resultant limited material, and short period clinics
 5 The degree of M D, and the passing of a state board
- examination in writing without showing any special ability to do surgery

 6 The helief of the new graduate who has not had a
- 6 The helief of the new graduate who has not had a surgical training that all surgeons have had to begin some time, and that they must do likewise Untutored, they proceed as opportunity offers itself.
 7. The inability of the inexperenced to overlook the
- commercial side upon seeing a large return they shrink from referring that patient to another

 8. The failure of the nations or those responsible for him
- 8 The failure of the patient or those responsible for him to differentiate between the trained and untrained man How can they? There are no marks to distinguish them
- 9 Last, and most important, is that complex problem, the open he-pital Much of the advancement in surgery has been made possible by the eastence of the modern hospital, which has afforded us a safe workshop un when we have been able to demonstrate operature possibilities.

Not one of us is ungrateful to those who have given liberally of their time and money toward the development of these institutions Many of our hospitals are managed in a magnificent manner, but more are not It is not the hospitals above enticism, but those below standard, to which I wish to pay my respects I feel that the fatter are more or less harmful factors in the development of surgeons and the practice of safe surgery, by reason of their encouragement of the patronage of operators of the poorer class, often indiscretion in the choice of staff men, poor nursing, and inefficient management. Public criticism has rarely been directed toward them because staff men, if they became active critics, were subject to the loss of staff postions, and always looked forward to improvement in conditions, while the public snewed the institution from without with an eye of admiration and deep reverence, it assumed that because it was a bospital, all within was perfect. It was not difficult to educate the public to the proper care of garbage which once was allowed to fill their alleys, and less difficult to teach them the danger of the sting of the mosquito or the dirt of the fly's foot, but in each instance general supervisors were behind the movement, to edurate on the one hand and to enforce the law on the other believe we will have to come to the same in general supervision of hospitals through state control. Such a supervision is justified in Illinois, where funds may be withdrawn from circulation by public subscription and through be-queathments to the benefit of corporate bodies, which in turn, because of existing conditions, charge unnatural prices for private service, those extending a certain amount of change are exempted from taxation and fiability for personal injury All hospitals strive to serve the state's sick, therefore the state is justified in seeing that its sick are well cared for You may give us medical men of the highest calibre, but they cannot extend the most efficient service unless the workshop is supplied with proper tools well kept, the help up to standard, laboratories complete and competently presided over, and the general management

In the first place, I believe great sums of money could be saved to the cause of the sick if there were some additional legal control of hospital construction As I have gone about the country the last fifteen years in a professional capacity, I have marveled at the indiscretions practiced in hospital construction. Often plans have been drawn by mere laymen or contractors or by architects not familiar with ho-pital construction or requirements, and often medical advice has The site has been improper, been ignored grounds too limited for growth, light and ventilation defective, and no provision made for special requirements of that locality, or too little space en en to housing patients has resulted in poverty and the closing of hospitals which might have served their locality well. Others have been abandoned or sold at a loss because of tack of forethought in erection \ \state adviser in all these matters would prove very helpful, tending to harmonize local factions and to direct the attention of boards to future utility and to economy, so that many a period of hardship would be averted

In Clucago we are seeing the installation of able, trained men and women as superintendents of our better institutions. The day has passed for the untrained Sister or Brother Superior or the widow or down-and-out man to reign supreme in our hospitals, where so much intelligence and caution must be exercised in so many and varied departments. When husband, wife, or child is placed in one of these institutions, those at home have a right to expect that the hospital to which they are entrusted be well managed. Whose business is it to see to this? Whose business is it to see that a hospital superintendent is qualified to oversee all of those entrusted to the hospital? Who asks where the milk supply comes from? How is it kept? If the dishes and bed-vessels are sterillzed before being handed from one sick room to another? If the superintendent knows what infections to exclude from the hospital, or how and for what to establish and maintain quarantine? If our operating rooms are unsafe, to whom may we report that after the management has failed to correct the defects? If the help is unskilled or equipment defective, who may pass upon that after the local management has failed to act? All these delinquencies have been encountered, and tend to discourage surgeons, who must be exacting because of the nature of their

For years one hospital of this city purchased milk of such poor quality, seemingly contaming preservatives, that, as fond as I am of milk, I could never drink what was offered me there Yet this unfit food was the only food of many

patients.

One hospital refused to purchase instraments or to keep those on hand in good repair, hecause they were said to be misused or would disappear. Those who wanted a respectable equipment had to bring their own. Yet what could have happened had special emergencies come in? Every hospital, whether inviting emergency work or not, should be required to have a specified equipment kept in proper repair.

After the control of the plastic suggery on an aged woman thosh solud not have been exposed to the dangers incident of the proposed to the dangers incident of the proposed of the growing hospital that a graduate nutre must be put in charge, and if she could not secure one to notify my office. She expressed great willingness, but the next day I found instead a young woman who had been in training three days, the purpose of the operation was defeated, and henceforth I was unable to get an audence with the lady in authority. Such expressions of

ignorance on the part of those in authority is exactly what I mean to direct attention to, and I think the time has come when others will have Iess hesitancy in doing likewise, which will result in some care being taken about who is put in charge of hospitals. This care will be increased if the state effaces that law exempting charitable institutions from liability.

In order that internal conditions may be hrought to the highest standard of proficiency, and ultimately a reduction in institutional cost to the sict, now evolution, I would advocate that all charity institutions also caring for pay patients be required to spend their net earnings, inherited and subscribed funds, or the proceeds of either, in or upon their own institution, instead of being disbursed in the development of sister institutions at other points I can point out to you unfit operating rooms in this city which would not have become so had a state inspector made irregular rounds throughout the year.

It must not be understood that some supervision is not had of hospitals in this city. It consists of regulation of floor and air space, sanitation, keeping of records, and elevator and fire inspection. The state now has no direct

supervision of hospitals.

The hospital may further influence the doing of surgery through the conduct of its nurses' training school After several efforts before the legislature of this state, a State Board of Registration of Nurses became legalized, whose duty it is to examine and register graduates. Upon cannot have suffered to the state of requirements. This was because of inadequate courses of study or a deficiency of work, often limited in variety.

It has been stated that it takes time for training schools to arrive at a point where they can command proper talent as pupils and teachers and do proficient work. In reply I can only say it depends upon who is behind the gun. 'The Nurses' Training School at the Children's Memorial Hospital, then only two years old, was in advance of the State Board requirement when the first state-wide inspection was made, and then and now stands in the fore-rank among schools of the state. It does so because those behind it have sought far and wide, determined to secure the best and most talented teachers available, pay them fitting salaries, and set the standard of admission high, they are serious and systematic about matters of practical and didactic instruction, and provide fitting quarters and refining influences for their pupils

We must have the best quality of nurses obtainable and must do all we can to make the work more attractive to a high grade of womanhood. that our natients may obtain the most intelligent care in the hospital and at home. Nursing was at one time the most inviting field to sensible. self-respecting, and well-educated young women, but not as many of this fine type are entering the field as should Complaint is justly made that hospitals cannot secure enough applicants with proper educational and other qualifications, yet some of the better training schools seem well supplied. Hospitals have no one to blame for this deficiency but themselves. The reason may be seen in their miserable dining-rooms, with worse dining-room service, the dormitory quarters with lack of privacy, absence of comfort and homelike surroundings, long hours without considerate regulation, poor if any rest-rooms or gathering places, and the unpedagogic management of courses of instruction. The atmosphere has often been too clouded with the spirit of getting three years' work out of young women at the least cost, rather than that of doing a great uplift and educational work. We may expect much good to come from indirect state regulation already in force.

Will hospital managements ever learn that at the operating table, serving as first table nurse, where all is exactness in eleanliness and procedure, is no place to train nurses? We must insist that everyone in general charge of the operating room suite, the one serving as first nurse at the instrument table, those in charge of floors containing patients, and the training school superintendent, show competency before being allowed to assume that duty. The nurse in training who serves at the operating table retards every operation, increasing the risk to the patient through longer anxsthesia and unnecessarily long exposure of wounds. Her asepsis is tarcly good, and by the time she has learned to assist speedily and carry out good aseptic technique she is transferred. The untrained floor superintendent neither instructs pupils nor supervises well, yet orders are all entrusted to her; while the inferior training school superintendent is responsible for poor organization and poor nursing throughout the hospital

By their staff appointments hospitals may unther influence the development of surgery. The more sectarian, the more liable they are to be inclined toward arbitrarism and sectarianism. Happily this is not altogether true, for they cheeringly appoint to membership those who assure a large patronage. These are not places for the inexperienced or those who can never arrive.

Such appointments should never be given to anyone who has not qualified, for that very appointment places institutional and perhaps fallacious professional approval on the appointee. Public welfare wilf he best conserved if such appointments are left to the profession, and the number of appointers limited to the actual requirements of the hospital. The first object should be good and safe service to the sick; the next, recognition of men who have prepared and made good. This condition of affairs will prevail when the state takes a hand in these appointments through civil service or through joint control, requiring exhibition of proficiency before any appointment is made. Until then, each of us should be careful to influence only the appointments of trained men, and not the aspiring novice.

A few years ago a staff newly organized showed a list of regulars, associates, and consultants numbering about forty. There were about on bundred beds in the howe. I strongly advocate a compact staff, with a view of centralizing, exponsibility and promoting better organization, therefore greater proficency. The village hospital or that of a small city should not strive to prilat or that of a small city should not strive to in the town, nor should every bornt member seek to place his favored physician on the staff. The old system of appointment at Cook County Hispital through indicence resulted in many surgical through indicence resulted in many surgical through indicence resulted in many surgical strangers.

jokes, which were no jokes at all to the patients. Nor do I believe in the system of appointing non-active members to hospital staffs. The attachment of such names is misleading to the public, the hospital bearing the reputation of being attended by men who do not attend, and an empty honor is bestowed for which no service is rendered It often removes active control from the hands of active men who should be in control, because they know local conditions and requirements, and it is their demands that are to be met. and they justify this control because of their labor and the income they provide the hospital Methods of hospital organization in non-teaching private institutions should be uniform and appointments equitable The chief should prevail only in teaching institutions or those in which there is a reasonable prospect of the introduction of medical teaching Even the Massachusetts General has given up the appointment of a chief In a democratic country, at least in the way our local hospitals are run, the chief does not direct assignments, nor can be influence the manner of doing pravate work which constitutes the majority of that done.

The most flagrant sin in which hospitals may

co-operate is "the open door," first prompted through generosity and a thorough desart or earted the usefulness of the plant to all the profession; later assuming the attitude of competition, inviting entryone who wishes to do surgery. This would be very generous and show a fine spirit, as first intended, if all who attempted major surgery were qualified to do it. Many of us can recite observations which would in themselves arouse such indignation as to invite laws without further solicitation on our parts

It is in the open hospital that one sees or hears of the one to two-hour appendectomy, the fourhour hysterectomy, the one-hour dilatation of the cervix uteri with uterine curettage, and of occasions where the operation is lost in the field, and the interne completes the operation

for him

I would not advocate the exclusion of men who are not surgeons but who operate safely and intelligently, but I would advocate a policy on the part of hospitals of refusing to take patients to be operated upon by those who do notoriously poor and unintelligent work with a high mortality I would further advocate state supervision and serutiny of all hospital statistics, and where mortalities rise higher than the average, find the reason why, and if they continued abnormal close the hospital. This would bring about exclusion of those who should not operate. The work would rarely be undertaken at home, because such operators would not thus have the moral support afforded by doing their work in a hospital

You of maturer years must not tell us that these revisions are up to the individual worker. Your work goes smoothly on, so may mine; but our combined work is only a small fraction of what is done throughout the state. Many of the workers have far from perfect environments and conditions and must make the best of them, just as you and I have had to do until our position or the volume of our work commanded more consideration. It is only by legal regulation of the hospitals that we may expect prompt and general revision of defects, thus providing greater satisfaction to all those engaged in doing surgery and greater safety to those entrusted to them.

I suggest that our body, through a committee of its members, strive to have laws enacted which will have to do with the distinguishing of those who have qualified to do major surgery from those who have not, and laws regulating institutions caring for the sick, thus making such matters the state's busness instead of that of the individ-

112

I believe that more systematic and thorough teaching of surgery and requirements additional to those necessary to obtain the degree of M. D. should be given by medical schools to those wishing to practice surgery, an added year or a required interne or assistantship, or both, are worthy of consideration.

I further believe that every man who will have qualified to do surgery will welcome special demands by the school or state, and that every good hospital will consider state inspection and regulation an uplifit

DISCUSSION

DR. GEORGE W WEBSTER, president of the Illinois State Board of Ifealth, was asked to open the discussion. Ife said: It is axiomatic that good health, with length of years, is the greatest asset of the people of the state. Any plan or method which has for its end that of elevating and improving the standard of medical education in the state must be for the betterment of, and must result to the advantage of, the people of the state, and therefore should receive our commendation, our encouragement, and our support All pioneer work meets with opposition is notoriously true when that pioneer work concerns education, whether it be special professional education or any other kind of education In our own state there are those present who remember the fight that was made in our legislature in order that we might have high schools We

now regard high schools as a necessity. In the same way there was the same kind of fight, the same kind of opposition, to the establishment of normal schools for the training of teachers to teach in our high schools. Now we regard these schools as absolutely essential and fundamental in our educational system.

In this plan which is proposed it seems to me that there are many elements of good, and yet some difficulties in the way. If we are to have a degree in surgery, one that is to mean somethang to the people of this country and to the people of the world, that degree should be wider than the boundaries of a state. It should be nation-wide in its character. If it is to be nationwide in the character then it must be an educational requirement or degree, and not a legal one, the resoon being that under our Constitution all

the powers that are not specifically given to the federal government, and not denied by that instrument to the states, must reside in the states. The license and control of the practice of medicine is not given by the Constitution to the federal government, but resides in the state. and comes under what is known as police power. To have a degree in surgery that would be national in character would require, first, an amendment to the Constitution of the United States, second, an amendment probably to every state constitution in the Union, and third, an amendment to the medical practice acts of all states. So it would seem to me that, if we are to establish a surgical degree that is really of high character and that will commend itself to the respect of the people at home, as well as to the surgeons abroad, it must be an educational requirement rather than a legal requirement, because if it be legal, and therefore a state requirement, it again will vary very widely, just as a medical degree varies in its character in one state as compared with another A surgical degree that might be conferred in the state of Illinois might differ very widely from a surgical degree that was granted, we will say, in Texas or South Carolina or Mississippi If it is to be broad and comprehensive it ought to be of national character

It seems to me, however, it is a step in the right direction. It is something that probably is bound to come, and yet, while we are thinking of this, we must think not merely of surgery but of the whole field of medicine You men doing the surgery of the city of Chicago only think in surgical terms, and yet we must be broader than mere surgeons and must bear in mind the enticesms that have been offered tonight on the character of surgery that is done in the small hospitals In the small cities outside of Chicago, or anywhere else in the state, it is fully equal to the work that is done in obstetries, and the nork that is done in obstetries is probably fully as high in grade as the work that is done in diseases of the eye and ear, or in rhinology, or laryngology, or, for that matter, in the practice of medicine itself. So that if there is room for improvement in the surgical degree, there is also possible room for improvement all along the line

In regard to the question of licensing hospitals, it seems to me that is a very valuable point in the paper of Dr. Bulord, and it is true, as he says, that the state exercises no supervision or control over the hospitals in its borders. That is largely because of the fact that the state law

says specifically that a village, a town, a city incorporated under the laws of the state of Illinois, shall have power and authority to do all acts and make all rules and regulations that may be necessary or expedient in the interest of public health. Those are the words of the statute. In other words, our Constitution and our plan of government favor local self-government, local option, and each community is left entirely free to manage its own public health affairs as it sees fit, so that there is that difficulty in the way of the states managing or controlling or supervising or licensing hospitals. In the city of Chicago, for instance, the department of health has control over the matter of licensing and supervising hospitals, and these hospitals are required to make reports to the department of health, and the department supervises and regulates these hospitals. The smallest city or village or town in the state of Illinois, as incorporated under the Constitution of 1870, has just as much authority and power to regulate its own affairs in regard to its hosnitals or anything else as the city of Chicago But I want to be recorded as heartly in favor of anything of this character that seems to be a movement in the interest of higher and of better medical education in the state of Illinois and in our whole country. I wish to thank you for the privilege and

I wish to thank you for the privilege and pleasure of being with you

DR A J OCHISANE I have always had very definite ideas about the qualifications of surgeons, and I am very glad this subject has been brought before us, and also that the Chicago Surgeat Society is to have a committee which will carefully study the subject, because it will require an endless amount of study before rules can be formulated which will be worth much

You know, of course, that there are two very distinct systems-the German system and the English system of qualifying surgeons In England a person is not looked upon by the community as a qualified surgeon unless he be a Fellow of the Royal College of Surgeons, or unless he has the right to print on his card I R C S. and that right he receives by performing certain duties and passing certain examinations, and by having performed certain services which are recognized by the Royal College of Surgeons as entitling bim to the position of fellowship Every licentiate, however, is permitted to do surgery if the community desires him to do it. and the F. R. C S title but places him in the position in which the community knows that

competent persons have considered him competent to do surgery.

In Germany we have entirely different conditions. There the community knows that a man who has been an assistant in this or that a man who has been an assistant in this or that a man who has been an assistant in this or that he has not a clinic behind him, the community does not look, upon him as competent. In neither case is there an element of licensing such as has been spoken of to night

When we look back to the time when many of us came to Chicago-as, for instance, the time when I came here-when we had Moses Gunn, Charles T. Parkes, Christian Fenger, as the great surgeons, not one of these men had ever been an interne. Christian Fenger had been an assistant in a pathological laboratory, but neither of the other two great surgeons had even had an interneship. And still, compared with the men we have in Chicago now, these men were giants. They were great surgeons were thoroughly competent compared with conditions now You take the greatest surgeons of this country to-day - Charles and William Mayo-and neither of them has ever had an interneship in any hospital. When you come to make specific requirements for licensing these facts will come out, and it will be a difficult matter to make it clear to the legislature, for instance, why we should have laws now which would have excluded these men had they been in effect in the days when they entered the practice of surgery To have had such laws would possibly have eliminated the greatest men in those days from the right of being licensed as surgeons. We must, however, bear in mind that the conditions are entirely different from what they were then, and that the qualifications ten years from now will be entirely different from the qualifications which should obtain to day

The reason why every German surgeon, no matter where you see him, is a good surgeon, a competent, high-class surgeon, is because every one of them has gone through a certain course of assistantship, in which he has come in contact with an endless amount of practical work that naturally would make a good workman of him The reason why there are so many excellent surgeons in this country is because these men who have become excellent surgeons have had to fight conditions They have had to make conditions They have had to work against conditions They have had to take things as they nere, and, with an endless amount of energy and an endless amount of labor, and with no regard for their personal comfort, they

have worked out of these difficulties and have become really first-class surgeons. Now, with these extremely complicated conditions, I believe that, if we should jump at some conclusion and try to work out this year, or this month, or within a few months, a reasonable system, we would fail On the other hand, if we go at it from the bottom up, work it out, work out the conditions just as the Council on Medical Education has done in the American Medical Association, in taking the conditions as we find them and putting them together, and not trying to establish conditions such as we think we should have, but rather such as we find that we can have with our surroundings, -then I believe we will do something that will be worth while,

One of the most important elements in the production of competent surgeons must be attention to our own assistants. Those of us who have the good fortune of having hospital appointments in which we can do things can give a great amount of attention to our assistants In other words, plan our work so that after an assistant has been with us for one or two or three or four years, he has had opportunity provided for developing into a good surgeon of course, does not mean that the road has been easy for him, but that we have put an endless amount of labor on him, and made him pick out or dig out his possibilities. In thinking over this question since it was suggested at our annual meeting. I have called to mind the men in this country whom I would be willing to class as surgeons that would be good enough to operate on me or a member of my family. Of these, there is a very large proportion of men who have had a class of surgical training which I would not consider proper to entitle them to a fellowship in a national surgical college like the Royal College in England Still, these men have become infinitely better surgeons than some of the men who have had most excellent educational opportunities-some of the men, for instance, in the older cities, such as New York, Boston, and Philadelphia. I believe this committee will have a large amount of very responsible, interesting, and profitable work to do.

Dr. M L Harriss For many years the elevation of the standard of medical education has been a subject of discussion in the medical prodession. The chief object in organizing the American Medical Association was to elevate the standard of medical education. That this should be a subject for discussion in the profession is perfectly evident when we stop to think that only the profession itself is capable of judging what

is good and what is bad medical care or treatment. It is a fact that people, as a rule, are incapable of judging what is good and what is bad in medical treatment.

We know that it is necessary to improve the standard of medical education, and during the past few years much has been accomplished in that line by systematic work. Previous to that time the American Medical Association attempted to elevate the practice of medicine, but it did it by passing resolutions, and we know what kind of paving stones resolutions make It was not until we payed with money that we got any results. When we spent money we got results, and we have done more in the past five years with the money we have spent to elevate the standard of medical education than was done in sixty years previously. We have improved the conditions in the medical school-, but we must remember a medical school is simply a place for teaching a few facts to an individual Any normal individual can be taught some facts if they are hammered into him long enough and hard enough llut we seem to forget that teaching them facts is not making a doctor. Becoming acquainted with facts is knowledge, but there ls something beyond that. Knowledge is absolutely worthless in the practice of medicine unless that knowledge is ruled by good judgment. and we forget that judgment is an individual quality that rests with the individual himself, and that no power outside of that individual can ever give it to him Of course, we can bring up the facts to him. We can teach him what Fact 1 is, what Fact 2 is, etc , but what he has got to do is to determine what will be the sequence-in other words, what is the inesitable dependence of these facts when they coexist In the individual That is judgment, and that is wisdom, and you cannot teach it It is part of the individual himself

Dr. Ochsner has told us about these great men and said they full on that these advantages. That is true. It is true in every line of life. We have great men Can we lay down rules for them? Why, no They are above ordinary rules. These men are not great suggrous because they had great teaching Dr. Ochsner "Systhey overcame obstacles. In the control of the superior of the control o

such men are the great exceptions. They seem to show what good material can make of an individual.

Non, when a physician gets out and begins the practice of medicine, he is loaded up with a lot of facts, but he has little or no judgment. It takes time and experience to develop good judgment. If one's judgment is wrong, and sometody shows him it is wrong, the next time he will work out another conclusion. But he has to work it out himself. This does not apply to the surgeon any more than it does to the physician or the specialist in any department. Some people neer have good judgment; and it would make an difference if they were to practice medicine for a hundred years,

All of our statute books are overum with medical lass that are not sorth a continental. I believe every medical practice act in the United States is fundamentally wrong in principle. In making that statement it is not a snap judgment, because I have been over the medical practice acts in every state in the Union, and I know what there acts are They do not help the people because, there is not a single medical practice act in the United States that is put in force and lived up to—absolutely not one.

The present method of licensing a physician or surgeon, I believe, is absolutely fundamentally wrong in principle There is no way of getting good surgeons and good physicians until the people know what a good physician and a good surgeon is, and when they know, and ask, and demand good surgeon, and good physicians, then they will get them and they will never get them until they do My idea is not to heense anyone to practice medicine. I would let anybody practice medicine that wanted to and could get the opportunity I would not care whether he had been in school in his life or not, provided he had the necessary knowledge. Any sane adult individual has the inalienable right to get anybody to treat him that he wants to, and no one has a right to say he cannot do it so fong as he harms no one cise by so doing What I should do if I could, would be to have a high educational standard, and have a highclass board independent of every outside influence, and I should have that board pass on the educational qualifications of the individual who desired to practice medicine If that individual had an education up to the standard set by that board, then the board should be able to stamp him as one qualified to practice medicine, and he should be permitted to let the public know that he had these qualifications. It

makes no difference whether it be medicine or surgery, the principle is just the same. I should also have it so that no person who had not the approval of this board should be permitted to go before the people as a qualified physician, and it should be so simple, so easy, that no person, however ingorant, could fail to get a qualified man as a doctor if he wanted one, and if he did not want one, he should have a perfect right to get any other man he wanted However the criminal code should distinctly provide that any unqualified person who attempted to treat the sick in any manner whatsoever, and who thereby subjected others to harm, as for instance contagion, etc., should be held criminally liable. The liability should also extend to those who deliberately provided unqualified persons to treat sick minors or other dependent charges, and there are many other restrictions, which need not be mentioned at this time

Again, I do not think anyone should be a surgeon who is not a physician I do not think any man should practice surgery or any other specialty who has not practiced mechanic a certain number of years There is no part of the body which is independent of the whole

Under the present medical practice acts it as practically impossible to convict a quack in any state in the Union. What does it nean? The law Yo. You can write almost anything the do as they please. You cannot get any superior was converted which is above the sentument of the people. It all comes back to educating the people. When you educate the people as too what constitutes a good physician or a good surgeon, they will have them, but until then, they will have them, but until then, they will have anybody they want

Dr. JACOB FRANK: The subject to-night is whether a surgeon shall be recognized as such or not. I am fully in accord with the papers as read this evening, and I am glad that the Chicago Surgical Society has taken the stand it has Some of the members present will recollect that two years ago, in my closing remarks to the Society, I brought this subject before them. Therefore it is not new to me I have given it a great deal of thought. At that time I stated (the article was published in SURGERY, GYNFCOLOGY AND OBSTETRICS) that the old master surgeons had to work hard and faithfully to get the confidence of the people and to bring surgery to the important place it now occupies, and that it remains for us to retain that confidence and see that we keep up the standard of the surgeon

Asepsis and antisepsis have made the inexperienced young surgeon bold and reckless.

With all due respect to Dr. Oschner, with all due respect to Dr Mayo, and to other men who have hospitals in which no other surgeons do work, they are not the ones to judge what is going on in Chicago to-day. It is these open hospitals that allow young men to do surgery who never had any training, who have never had an interneship, who have only seen such masters as Dr. Oschner and others at work, that I complain about The surgeons I have mentioned, and others, do their work so easily that these young men, in watching them, think that they can do the same thing; and when they get a patient to operate upon they have him or her, as the case may be, taken to some hospital, and, as some one has remarked here, they commence the operation and then get the internes to finish it for them. This is not a question of to-day It is a question of the future

If we cannot legislate, if we cannot change the Constitution of the United States, if we cannot make laws in the state to protect the people against mediocre surgeons, then it remains for the surgeons in the city of Chicago, as a duty, to educate the people as to what constitutes a good surgeon All advancement, all great movements take root, not in the general welfare, but locally Christianity did not commence at once all over the world It commenced in an insignificant country that to-day is not recognized; but how did it advance? It has advanced as all movements for welfare advance, slowly but surely If we can educate the people in Chicago, and show that it is a success, then other cities will take up this matter and do the same thing.

One word with reference to hospitals-I could talk all night upon this subject. I believe I was the first to advance the idea of standardizing hospitals, in an address which I delivered before the Mississippi Valley Medical Association in welcoming the members of that body to this city, and which no doubt will be published in the official organ of that organization, namely the Laucet-Clinic The hospitals are to blame for the poor surgery and for the bad work that is done in them There are hospitals in this city that allow any man to go in there to operate. They know that this or that man cannot operate; they talk about their operating, but they take them in and allow them to operate on patients to get the room money. I say, any hospital that will take any patient, or a doctor that will send a patient to a hospital, telling the patient that he or she will receive better care than they

would at home, they are taking their money under false pretenses and ought to be liable for damage suits. If we cannot make legislation for surgeons, then we cannot make legislation for hospitals I believe we can make legislation for hospitals which will require them to give the people what they promise, and we know that there are hospitals here in which you cannot get the right kind of laboratory work done. There are some hospitals here who, when they find a man does not do good work, will invite him to stay away and this ought to be done with all hospitals. I hope that the movement that has commenced in Chicago will continue, and if we cannot make a national affair out of it, let us make of it a local affair, and let us make it successful. If it is successful in Chicago. I am sure other cities will follow

DR. CARL BECK: "Times change and we change with the times" is a Latin saying, and I think it may be very well applied to all reforms Twenty-five years ago a discussion of this same subject took place in Vienna In Austria there was no interneship except assistantship, and in the very well equipped and well governed hospitals of Austria there were men like Billroth, Gussenbauer, and others of equal fame as surgeons. Outside of these men and their assistants there were no trained physicians or surgeons. Then the question arose as to what should be done with the young men graduates. Should they be "let loose," as Billroth said, upon the public without any practical knowledge, or should there he a law that every man desiring to practice medicine should be obliged to spend at least one year as an interne in a hospital? This Interneship could not be extended to all students or to all doctors, but the opportunity was afforded to a large majority of them, and to-day very few men practice surgery in that country unless they have been either assistants or "secondaries" for a number of years-not merely one or two years, but for a number of years These conditions are deeply rooted in that country. Everything is law. Every step is law. Everything that is forbidden is so stated on a blackboard, and you can see the word "Forbidden" posted everywhere The public of that country has been educated up to that point

In this country it is freedom that has made the surgeon I cannot refute the remarks of Dr Harris. I think myself, having grown to manhood across the water and in that restricted field, that freedom has made the surgeons of America the ideal surgeons of the world. Whenever the subject is brought up abroad the foreign-

ers always point to you, the American surgeon. as the surgeon of to-day; and personally I would trust myself to a hundred American surgeons if I were to be operated upon, while I would be exceedingly careful as to placing myself into the hands of as many Europeans. The freedom we enjoy in America makes the surgeon; but in our day that freedom is misunderstood by many, and hence every opportunity to operate is taken advantage of by men who are not competent to operate. Patients are being operated on by tyros and by men who have never had any surgical training. We have a great many men who are what we call average surgeons Of course there are certain geniuses, like the Masos, who do not need an interneship Either one of the Mayo brothers would have been a teacher and surgeon without having received training under masters, although they have witnessed the work of a number of the great surgeons of this country and abroad Raphael would have been an artist even if born without arms Dr William Mayo has traveled about with Dr Ochsner very extensively, and they have both stood at the operating table, of some of the greatest surgeons of the world, and no doubt both have profited by this training and observation There is no one man or surgeon who has a monopoly of things, and almost every surgeon can teach another surgeon certain things that the latter does not know or perhaps an easier way of doing a certain operation But for the majority, for the average man, there must be training-not of one year, but of many years, and some such system as they have in France or in Germany should be advocated. and the public, first of all, should be educated to recognize those who are entitled to do surgical work, and particularly major surgical work There are many so-called surgeons who do aungling surgical work in hospitals in consequence of lack of training Of course, all of us have done some poor work in the early part of our careers. We must all acquire experience, but most of us have acquired our experience by assisting a master for years, experimenting on cadavers and on animals only-not upon patients, as would be the case if surgery were practiced without an assistantship having been served I therefore agree with Dr Frank that every man who desires to do surgical work should be trained for it.

DR D. W. GRAHAM was asked to continue the discussion. If said, I agree with much that has been said, and disagree with some of the speakers in many respects. There is one remedy which I think will correct this evil to a very great extent, and that is to let the surgest reduce their fees one half or three quarters. When we do that, the temptation of an incompetent man to operate on major cases will disappear, and he will not do it. When we get down to the root of the matter we will find it is largely the money question. I do not know that I would be the first one to climb down, but I be suggestion must be considered if we would account for the evils complained of.

Another point: Bad as the situation is, is it any worse in surgery than in any other department of medicine? You have heard the experiences related by Dr Harris, and I am sure all of us could tell similar stories We see the most ignorant kind of prescribing, the most ignorant kind of management of patients, woeful lack of qualifications in therapeutics, and in diagnostics as well There is as much complaint about had obstetrics as about had surgery so in every operative department of medicine What does this point to? For one thing, that the standard of qualification should be raised all along the line. I believe some kind of a plan can be worked out for a voluntary organization such as has been spoken of which would have a good moral influence on the community and the profession. But it should be remembered that many men could get into such an institution by reason of their scientific attainments who would yet be bunglers in any operative field I do not believe we can ever get a legal standard for any specialty in medicine, and I hardly think we should have

DR. WILLIAM M HARSHA: It seems evident from the papers and from the discussion that there is something wrong, and it does not seem clear how it can be remedied I agree with Dr. Graham, that the need of the practitioner for business is one of the causes why he attempts surgery When I came to Chicago twenty years or more ago the Chicago River ran the other way, and one could not catch fish within two miles of the river, but he could catch typhoid fever any place in town. All of the doctors seemingly were husy in treating diphtheria and typhoid fever Now, with the anti-tuberculosis crusade, the fresh-air fad, and the daily education of the people by the papers, health builetins, and giving them a general all-round education, the income of the average practitioner has been materially cut down, and with the activities on the part of the state board of health, other diseases have been eliminated. All of these things have tended to reduce the amount of

work that is done by the practitioner, and so he is looking out for other fields-and he is going to do surgery. It will be impossible, in my judgment, to get legislation to regulate this matter until public sentiment is educated, and that takes a long time. I do not believe Chicago has any patent on this particular uplift movement. Two years ago or more the late Maurice H. Richardson had a splendid article in the Annals of Surgery on this subject, namely, "The Training of Surgeons"-meaning, course, special training and the need for it. I believe, too, as Dr. Webster has pointed out, that this ought to be a nation wide movement. The sooner it can be agitated by the American Medical Association in its organ, the sooner it can be made a nation-wide subject, the sooner we will get a unified expression from the medical profession, and the sooner we will get legislation. if we ever can; but before we get legislation we can create an interest in the minds of the people in this movement that will do much to aid this causé.

The standardization of hospitals can be brought about through various associations in various states. I think what Dr Frank has said is very important I beliese every hospital will strive to meet the requirements that will be made of it by a commission that is properly authorized and organized—one that will extend all over the country

DR C C. ROGERS I have enjoyed these papers very much, but I have not heard any legitimate way of remedying the evil I believe exposure or publicity is the best way to belp to remedy any evil, whether a person belongs to a certain society or not No one should be exempt. I believe that if every patient who died within a certain time following a surgical operation was a coroner's case, and the coroner was at liberty at any time to open the abdomen and examine the patient and see the exact cause of death, putting the cause as found on the death certificate, it might make some of the members of this society blush to see the report on the death certificate, no matter how long the surgeon has been doing surgery or how old or experienced he may have been. I believe that would be the best way to educate the public to distinguish between a good surgeon and a poor one. For I believe the relatives and friends have a right to know the cause of death. Not only that, when we operate let us observe what is removed from the patient, and let us compare what is removed from the patient at the time of the operation with the condition of the patient when

death occurs, and find out whether the pathology was sufficient to cause death or whether the surgeon himself caused the death. I believe that is the way to get at it. You cannot make a surgeon out of a man by having him witness a few operations. You may put a man in a a hospital and give him 18 months' hospital training, put him under a good surgeon, and have him assist the surgeon for 25 years, and he may not be able to do an operation as it should be done when he gets out.

DR D. W. GRAHAM: I would like to ask Dr. Rogers how he would get the coroner's office trained to pass correct judgment on these things.

trained to pass correct judgment on these things. It takes a good physician to do that, and the average physician in a coroner's office cannot tell what a patient dies of, by any means, even when he has the advantage of a full clinical

history, which he does not often have.
DR. ROCERS: I can answer that. I believe
we can get physicians who are not grafters to
act as coroner's physicians, just as well as we
can have a society called the Chicago Surgical
Society and that society can determine whether

I am fit to do surgery or not.

DR. COLEMAN G BUTORD (closing the discussion on his part). In taking up this matter and the work in connection with 1t, I think it ought to be restricted to the state. There is no use in trying to influence the entire country all at once. No doubt our position will be surtained, and other states will follow our example.

tained, and other states will follow our example. With reference to the master of some good surgeons having received no early training through interne or assistantialips, I will say that although my acquaintance has been large. I have not had as extensive on acquaintance has been large. I have not an expensive or a considerable of the same have been forced into doing surgical works, either by some of some land being unexpectedly brought to their door

The Reger told me he had served as amanuemis in an eye and eat hospital and under Meyer is in an eye and throat clime for some time. I am an ounder the impression that Fenger served in a hospital as interne [Reference to Fenger autobiography shows that he served as amanuemis in Wilhelm Meyer's clime and in his private practice, and that he served at two-pur interneship in the Roy Frederick Hospital in Copenhagen beginning in 1869 | Fenger was drawn, into

surgery in a good many ways. He was with the Danish arrny as assistant ambulance surgeon through the Schleswig-Holstein war. He went back to school, graduated, and then went to the Franco-Purssian war, serving as ambulance surgeon, so that before he got back into pathology he was a trained surgeon.

DR. GEORGE W. WEBSTER: I would like to say a word in regard to one remark made by Dr. Harris. I understood Dr Harris to say that law has had nothing to do with the advancement of medical education or the raising of medical educational standards in this state or in this country That statement, it seems to me, needs no answer, yet I would like to inquire what it was that drove 2500 men out of the practice of medicine in the state of Illinois in one day. It was the enforcement of the medical practice act of 1877 in this state. I would like to inquire what it was that has raised the standard of medical education in this country from the standard of '76, when that standard was such that any man, without any preliminary education, without any medical education whatsoever (a standard which Dr Harris favors), could go out and announce himself as a practitioner of medicine and have a right to practice medicine in the state of Illinois The answer is, the law. The law is what has raised the standard of medical education in this country, and the law has been in advance of the sentiments of the majority of the medical profession of this state and in this country Gentlemen, in medicine and in everything else, in this country and in every other, a few men have had to do the thinking for the many, and it will continue so until the end of time

In regard to the question of whether it is right and fair and proper that anyone shall practice medicine, and that everyone has a right to employ whomsoever he chooses to treat him, let us take a concrete example. Here is a case of diphtheria in an apartment house, and here across the hall is a family of children Suppose the person who is permitted to attend that child with diphtheria is an uneducated person who knows nothing of the care of contagious disease and cares nothing for the rights of the community. and such a person comes in and does not care for the child and does not care for the community I want to point out to Dr Harris that in our Constitution -and we all live, thank God, under the Constitution-it is provided that every citizen has the right to hie, liberty, and the pursuit of happiness, and that no person has a right under our Constitution, where they have

a sick child, to employ an uneducated, unqualified person who does not take into consideration the rights of the people who are well; and the people who are well are the ones who have certain rights under our Constitution. We do not maintain smallpox hospitals primarily for the purpose of curing smallpox, but for the purpose of protecting the people who are well and who have a right to protection under our Constitution Gentlemen, we do not maintain a penitentuary at Johet primarily for the purpose of reforming criminals, but we maintain it under the police power of the state to protect the people who are law-abiding against the crime of those who are locked up in this penitentiary. We do not maintain insane asylums solely for curing the insane, but we maintain them for the purpose of protecting society at home, the people who are sane And so under the police power the people who are well have some rights, as well as the person who is sick and who is employing a physician. It is axiomatic that a person has "freedom to do all that he wills, provided he infringes not the equal freedom of any other."

DR. M. L. HARRIS: I would like to say a few words in answer to what Dr. Webster has said, and also in answer to the remarks made by Dr. Frank. If you will remember, when I stated that anybody should be allowed to practice medicine I said every individual had an inalienable right to employ whomsoever he pleased. I put it "the adult, sane individual" Everybods will recognize that inalienable right. I did not say anything which would imply what Dr Webster has said. I would raise the standard so high that we would be ashamed of every medical practice act in this country, including Illinois Under my plan, the man who treated a case of diphtheria by ignoring the rights of others would be in Johet I would have the standard raised so that the board could certify to the people that this or that man is qualified to practice medicine, and that is as far as the Board should so The criminal law should do the rest.

THE CHICAGO GYNECOLOGICAL SOCIETY

RECULAR MEETING OF THE SOCIETY WAS HELD NOVEMBER 15, 1912, THE PRESIDENT, DR RUDOLPH HOLMES, IN THE CITAIR

Dr. EUGENE CARY (by invitation) read a paper entitled "Chorio-Epithelioma Recurrence After Three Years, Invasion of the Spinal Canal, Villi in Secondary Growth (See p. 362)

Dr. Webster. I think we are favored in having this case worked up so thoroughly by Dr. Cary. Perhaps we would not have been so favored had not the physician of the patient, Dr. Slaymaker, been closely associated with Rush Medical College, and urged the advisability of a careful autopsy by Dr. Le Count The case interested me very much at the time Dr Lynch has just reminded me that I reported its chincal features before the Society shortly after I operated for the pelvic disease At the time of the operation a very unique feature was the presence in the left broad ligament of a mass the size of a large orange, consisting mainly of grape-like masses somewhat resembling a hydatid mole. An extension of these gray masses was found in the enlarged left ovarian vein. The appearance of the swelling brought to mind the rare tumor described years ago as racemose sarcoma.

This case emphasizes one point: that in doing a hysterectomy for chorio-epithelioma one

sbould never choose the vaginal route, because it is very important to remove the affected parts entire and with as little disturbance as possible. The abdominal operation alone should be employed

DR CARY. I have nothing more to say These sections show the valit in the mass which Dr Webster described as having been shelled out of the broad ligament

DR WEBSTER: The specimen exhibited tonight is moomplete. A considerable portion of the chorio-epithelioma was thrown away at the time of operation.

Dr. DORLAND: I would like to ask regarding the frequency of these cases following labor at full term, or abortions, or compared with cystic disease of the chorion As I understand, most of the cases occur subsequent to cystic disease. Dr. Carr: The condition occurs after each

of these conditions, probably most frequently after hydatiform degeneration of the chorion. It may also follow ectopic gestation.

Dr. J. CLARENCE WEBSTER reported the following cases:

CASE I. Imperforate anus and cystocele.

Mrs. S., aged 34, married 12 years, admitted to Presbyterian Hospital, October 14, 1912.

456

Complaint. Falling of womb. A mass protrudes from the vulva except when she is in bed. It followed an instrumental labor eight years previously. Since infancy there has been no control over the faces. A pad has to be worn over the vulva continually. Every few months she has bloody diarrhea.

On examination, there was found to be great relaxation of the tissues around the vulva, four fingers being easily admitted into the latter. There was considerable prolapsus of the antenor vaginal wall, bladder, and uterus There was no anal opening At the normal site there was a depression of the skin which was pigmented On irritating the surface, contraction of subjacent muscular tissue seemed to be produced. The bowel opened into the vulvar orifice at the lower end of the vagina, where there was some protrusion of the bonel mucosa

Operation. Anterior colporrhaphy was first earried out. The lower end of the bowel was then dissected from surrounding tissues for nearly two inches An opening was made through the skin and subjacent muscle at the site of the anus. The bowel was pulled down and stitched to the edge of the skin opening except posteriorly, where an opening was left for drainage. Repair of the permeum was then earned out. The patient made a good recovery, leaving the hospital on November 6th with a good pelvic floor and having control of the anus

The condition was one of congenital defect, in which the rectal part of the anal plate had persisted, the cloacal septum having failed to fuse with the perineal septum. The urogenital sinus was only partially separated from the rectum, so that a communication was left between the rectum

and the lower end of the vagina

It is interesting to note that the anal sphincter was developed at the site of the anus and not around the end of the bowel

Case 2. Large myofibroma of the ovary, ascites and extreme procidentia. Mrs. W, aged 68, admitted to Presbyterian Hospital October 14,

IQI2. Complaint Gradual enlargement of the abdomen during the previous six years, with tension of the skin. "Falling of the womb" first noted about six and one half years ago, having become more marked, so that now there is a mass outside the body about five inches in diameter Loss of weight. Frequency of micturation, pencil-like stools The patient states that she noticed something hard in the abdomen 12 years previously

On examination, the abdomen was tense and markedly distended. Signs of free fluid were present. There was an irregular, hard mass in the lower half of the cavity.

There was a marked procidentia, the bladder, vaginal walls, uterus, and part of the rectum being external to the body, the surface being tense owing the pressure of the ascitic fluid It

was ulcerated in several places.

Operation. On account of the poor condition of the patient's pulse and the presence of casts and albumin in the unine, the abdomen was opened under local anasthesia, a solution of novocain #1 s being employed Several quarts of clear ascitic fluid escaped Occupying the lower abdomen was a solid tumor measuring 20 x 15 x 8 cm. It was attached to the left broad ligament by a short stalk about 8 cm in diameter containing no visible vessels. There was no ovary on this side, and the tumor was evidently developed from this structure

On the right of the uterus the tumor was attached chiefly to the bladder, and slightly to the inner end of the right l'allopian tube and adjacent part of the uterus, the area of attachment being about two inches in width and consisting mostly of veins and arteries of considerable size. These evidently formed the main supply to the tumor, which had thus implanted itself, having almost entirely lost its original vascular supply from the left broad ligament. The omentum and tleum were adherent to the tumor over small areas. The patient made a good recovery

A careful examination of the tumor was made by Dr Eugene Cary, who reported that it consisted chiefly of non-striped muscular tissue with some fibrous tissue. After nine days extensive plastic work was carried out under local anxisthesia for the repair of the pelvic floor patient left the hospital on November 19 in

good condition

CASE 3 Large unilocular blood cyst of the wall of the uterus Miss W, aged 28, admitted

to Presbyterian Hospital September 23 Abdominal fullness.

Complaint months previously she noted that her clothes were tight Since that time there has been no noticeable increase Her health has been good. Menstruation was normal, 28-day type, of 4 to 5 days' duration

On examination, a mesial swelling was found in the abdomen, extending eight inches above the pubes It was tense and elastic and had all the characteristics of an ovarian cystoma. The body of the uterus could not be felt apart from the

Operation. On opening the abdomen, the tumor was found to be continuous with the body of the uterus, the ovaries and tubes being distinct from it. The surface was smooth and glistening, somewhat like the normal uterus in color, many small vessels being seen in the wall About 3300 cc. of chocolate-colored fluid was withdrawn from the tumor with a trocar, its specific gravity being 1020. The fluid consisted of serum-alhumin, containing fibrin-flakes, leucocytes, and red blood corpuscles, more or less disintegrated. Supravaginal amputation of the uterus was performed.

The specimen was thoroughly examined by Dr. Eugene Cary, who reports that the cyst had developed in the upper part of the uterine wall and that it contained one main cavity with two small subdivisions It did not communicate with

the uterine cavity

The lining of the cavity was smooth and was covered with endothelium-like cells, proliferated in various parts. It was well vascularized. Ifere and there blood spaces were found in the wall of the cyst. The wall contained no glandular spaces

of any kind.

This case is the second which has occurred in my experience. The first was recorded by me in the American Journal of Medical Sciences, March 1895 The specimen which I then described was, I believe, the first of its kind recorded in literature. The cyst was larger than the one described to-night and was remarkable in having developed in the wall of the uterus in a woman aged 53, three years after the menopause It resembled the present specimen very closely and probably arose from the enlargement of one of the spaces of a cavernous angioma which occupied the fundus of the uterus, from which the cyst developed The specimen described this evening probably had a similar origin. There was no indication that either cyst arose from Mullerian glands or Gartner's ducts

Dr. Lyncu: I would like to ask whether there was any evidence of the sphincter of the bowel in the pelvis It seems to me that this case is very interesting from the standpoint of the sphincter It is the second case that has been reported here. There was a case of colotomy reported by Dr Eisendrath That case was shown with a double uterus, and there were evidences of the sphincter being left in the pelvis I believe this is comparatively rare in the literature

DR. CURTIS: I would like to ask Dr. Webster regarding that fibroid Was the cause of the development of this fibroid the circulation in the ovary, or was there too much pressure on the blood vessels? In regard to cysts of the uterus,

two others have been described. One was reported in the Zeitschrift fur Gynakologie. In that case it developed from the remains of the Gartner duct. In the second case it developed from the lining of the uterus

DR. WEBSTER: Fibroma of the ovary may or may not be associated with ascites Dr. Reuben Peterson found that it was present in about 40 per cent of cases. As regards the uterine blood cysts, there is no evidence that they arose from Mullerian glands or Gartner's ducts.

Dr. Holmes: I wish to report a case of extrauterine pregnancy, which is of interest on account of the early appearance of rupture due to the fact that the gestation occurred in infantile generative

organs.

The patient was 25 years of age, her menstrual life began at 13, and from the onset the periods recurred with unusual regularity, almost to the hour on the twenty-eighth day. The flow invariably lasted but a few moments — at most a few drops of blood stained the clothing When she was 20 I examined her to ascertain the cause of the scanty flow The uterus was infantile, hardly a third of the normal size. Her marriage took place on June 10 She menstruated on June 25 and July 23 On August 24 she was seized with dizziness and abdominal pain On reaching home, a half-mile distant, she had an attack of navsea and vomiting The next day she had some abdominal discomfort, and for the next two or tbree days she had occasional slight metrorrhagia. Seven days after the onset of symptoms I examined her and found a small mass to the right of the uterus, this mass was certainly no larger than a normal ovary, and the ovary was not palpable. A couple of hours after the examination I opened the abdomen and found some free fresh blood in the lower abdomen The right tube was enlarged to a thickness of 3 cm., perhaps 4 in length, with a small rupture on the posterior aspect. This was removed, as a retroversion was present, this was corrected by suturing the round ligaments to the posterior wall of the uterus by the Webster operation The uterus showed little if any effect from the influence of the tubal pregnancy, the ovaries were less than half the normal size, the broad ligaments were exceedingly diaphanous - so delicate and transparent that the finger was clearly visible through their texture. Microscopic examination showed blood and an occasional poorly developed villus,

Dr. Ries presented a case of chorionic villi in the uterine wall eighteen years after a pregnancy, in which he stated that in regard to chorio-epithelioma there are two hypotheses: one, the hypothesis of congenital misplacement, and the other, the hypothesis of parthenogenesis, possible of course, in females only. In the first case, we have the villi passing from one part of the feetus into another. In the second place, il the ovum goes on to the stage in which it develops a protoplast and the other tissues fail to develop these protoplasts, then the protoplast becomes quiescent and we would find that the chorio-epithelioma remains. As you all know, chorio-epithelioma may develop inside of the uterus or outside of the uterus On what side do they develop if the uterus is normal? The chorio-epithelioma is then outside the uterus Leopold in 1889 did some nork on this subject. I did some work in 1894, and Meyer did some work later

The enithelial covering of the chorionic valli has been found to invade the uterus and has been found in the uterine wall. The chononic villa are said to disappear within a very few neeks after labor, but we can see the chorionic villi in

the uterine wall

We have had under observation a case of the development of the chorionic villi on the outside of the uterus A woman, 45 years ol age, came to me in April, 1912. She was a native of British Gulana, and married She had had four full-term pregnancies, terminating in normal labor with normal deliveries There was a normal history of the pregnancies, no history of hamorrhage last full term pregnancy was 20 years ago Since then she has had two abortions, the last one 18 years ago. Both of these abortions came about naturally - were not induced. The last one was terminated without medical interference with no hamorrhage, and to all intents and purposes was regularly completed She continued in good health until four years ago, when the periods of the four day type began to last from seven to ten days. She came to the hospital, and we found on examination that she had an irregular fibroid mass back of the uterus on the left side I did a vaginal operation The interest of the case is purely in the findings. We found the cervix haed with some translucent material We could easily see that this had been there for some time. I removed a portion of the tissue for microscopical examination, and an examination was also made of a piece taken from the tube It consisted of connective tissue, some capillaries, with some er throeytes. There were blood vessels in these villi, and their surface was covered with flat epithelial cells. It is clear that this covering is the same as an endothelium. It is evidently an epithelium that is covering these villi. We have nothing to show that these were villi which had invaded the

uterine wall. It is important to notice that a great many of these villi lined the capsule of the small fibroid. Many of these had little attachments in the hyaline tissue. The cavity of the uterus is perfectly smooth.

I called them villi because of their size, shape and ramifications, and because there was no evidence of vessels. You cannot call them thrombi, because thrombi have vessels I know of no other condition that would fill such a condition except ville. There is nothing like this case in the literature as far as I am able to find out. We have had filstoids of the uterus with a destruction of the valls in the uterine wall. From the work of Rokitansky we learn that a tibroid of the uterus encourages the growth of vills in the utering wall because of the growth of the fibroid. If they can remain for 18 years, there is no reason why they cannot live for a longer time. We do not know if any of the chorro-epithelioma covering has disappeared in this case. We do not know there were salli in the uterus all this time. I believe that the chorio-epithelioma eovering is a good reason why

there was chorro-epithelioma present

Dr Hours The paper is open for discussion. Dr. Winster, I think we must regard the communication as a very important record if it is reliable. How can we be sure that this woman did not have preenancies or abortions years after the date given? But even if that were so, the case would be interesting. The villi appear to belong to the second half of gestation I take exception to the statement that the covering of the vills has disappeared. It seems to me to be present at least in some of the slides. The continuity of the connective tissue of the villi with that of the uterus is interesting and is similar to that which may be found in normal gestation The feature of interest is, however, the extension of maternal blood into the vessels of the villi. This is not found in ordinary pregnancy

DR SCHMALCH: Dr Ries has given us a short review of the etiology of chorio-conthehoma There are a number of cases reported in which this growth did not start before six years after labor and the case of Halliday-Croom, in a

woman about 70 years old

In my review of chorio-epithelioma I have always advanced the opinion that in these cases a short pregnancy has been overlooked, manifesting itself only an a prolonged or abundant menstruction. We do not know much about the are of human cells Our brain cells are probably the longest living cells But in the specimen presented to-night we have to deal with a complete organized structure, whole valli, and it is absurd to attribute to them such a long vitality without any proliferation, even if they are situated within a blood vessel.

Dr. Stahl: I agree with Dr. Schmauch, and also with the suggestion of Dr. Webster that Dr. Ries clear up the question as to the probable period of development of his specimens. To me it has been a great pleasure to listen to Dr. Ries in his presentation of his subject-matter, his views, his theories, and his queries. The Doctor is usually encyclopædic in exposition and explanation. But has he not overlooked some original work bearing upon this subject-matter, presented hy a member of this society as far back as 1902? He mentions with interrogation hypotheses and theories extant to explain the origin of tumors, and especially these tumors, the chorio-epitheliomata, and that such expressions of tumor development occur alike in the male, the female, and the That such types of tumor should occur in the male, female, and virgin, extraordinary as It may seem, is what my studies would lead me to anticipate One of the theories he discusses, and perhaps the most weighty, is the one conveyed in the term "latent" and "delayed latencies" This theory was dwelt upon in an article read before this society and published in the American Journal af Obstetrics (Vol. xlvi, No. 6, 1902), and again discussed in a preliminary report, "The Decidual Cell Structure Contrasted with the Syncitial Nuclei (Langhans Cells) and Nuclear Proliferation Tissue," American Journal of Obstetrics (Vol. lii, No 4, 1906). There the writer speaks of the nuclei and nucleoli as follows.

"It is these wandering nucleoli that cause the decidual metamorphosis in the pregnant mucosa and assist in decidual loss of tone anticipatory of the more active destruction and absorption process of the maturer nuclei (the Langhans cell) These nucleoli are not only found scattered throughout the decidua, but are found throughout the general tissues of the mother The 'cell detritus theory' notwithstanding, and though it is accepted by many as the causative factor of the maternal metamorphoses of pregnancy, I still maintain that these metamorphoses are caused by the inherent qualities of these wandering nucleon. It is these wandering invading nucleon, with their syncitial plasm covering, possessing their peculiar chemicophysiologic function, that forms the unit or the greater part of the unit that induces not only the decidual metamorphoses, but all the other metamorphoses which occur throughout the maternal histology and physiology during pregnancy, and its sequelæ as hydatid mole, syncitioma, and their metastases.

"Cohnheim's theory of the origin of tumors is hased upon the theory of retention in mature tissues of embryonal elements. One of these elements, I advance, is formed by these nucleoi, which wander, are included in, and remain latent among mature tissues. When they awake to activity there is seen an extremely active proliferation of nuclei and nucleoil and a plasm without cell houndary, with destruction to their environment much like that seen in the activities of the nuclei and nucleoil of the syncitium, and in the active proliferation of the nuclei and nucleoil of the carcinomata"

Dr. Ries invites the question: What are these structures he shows under the microscope; are they villi? To me they read a histological structure characteristic of the villi of about the fifth to seventh month of development Not later, for they show a thinning of the outer syncitial structure with a single, in some places a double, row arrangement of Langhans nuclei, a progressive attenuation characterizing the latter half of development of the syncitial expression As Prof. Minot says: "Towards the end of pregnancy, however, the epithelium of the villi undergoes great alteration On the larger villi a true epithelial investment has almost entirely disappeared, and instead isolated accumulations of large round nuclei are found, and form protuberances (Zellknoten, or cell-patches) on the surface of the valli. Nor are the specimens earlier than three months, for they do not show that swollen, thickened amorbic picture of the active

syncitium of the early villi' Dr Ries speaks of his specimens as an expression of a late "latency" development, and occur-ring in a blood-vessel. That such a tumor may develop in such manner and tissue, and with such a causative theory, was intimated in these articles of 1902 and 1906. There, there are histological photomicrographs showing the wandering of the syncitial nuclei and nucleoh into maternal and fortal tissues There will also be found illustrations of the pulmonary metastases in Dr Bacon's case of deciduoma malignum, originally reported in the American Journal of Obstetries (Vol. xxxi, 1895). Dr Ries some time ago (its discussion should also be found in the transactions of our society) kindly loaned me some slides showing Langhans nuclei among the cells of the liver. This wandering of the syncitial nuclei and nucleoli is normal, their decadence is normal However, some persist, survive their environment, and remain quiescent, thus becoming latent When aroused there is the tumor, the metastasis, in and of any tissue. It may be ten

weeks, ten months, ten or more years after the original wandering and latency.

460

DR. LYNCII: The case is interesting to me. It was originally considered that the vill were of the one or two months' type. It seems to me that they are the vill of the fourth month of pregnancy. These vill were very uniform. It seems to me that we could make out the choriopithelioma. In their structure the blood-vessels were uniform in shape, while in pregnancy the blood-vessels are altered. We will find these villi in the tissue even years after pregnancy.

DR. WEBSTER! I would say that I hast examined these villi with the low power, but later have examined them with the high power. The covering appears to be chorionic epithelium similar to that found in the second half of normal pregnancy Dr. RIES: I am glad to hear this discussion regarding the covering of the villi. Hi it were as generally supposed, it would suit my diagnosis. The observations which Dr. Webster made are interesting, and we should remember that the chorio-puthelioma fills complete sinuses. I have studied the covering of this villus for many weeks, and have gone over these sections repeatedly with both high and low powers. There is no question but this is a definite epithelioma. I have not been able to see with the hap power any of the chorionic villi. The case, of course, is an interesting case.

Dr. Schmauch: I only want to mention a similar case that appears in European literature by Divitsky That case occurred 75 years

CORRESPONDENCE

PREPARATION OF WAXED SILK

TO THE LDITOR. So many requests have been made of me for the method of preparation of the waxed still which has been in use by me since 1880, that I have thought it desirable to ask you to within it.

to publish it Dr. Moses Gunn, in 1874 after a visit abroad, brought back from England with him as a gift from Sir Joseph Lister, a supply of the then won-derful "phenic acid" This he added to melted pure yellow beeswar in the proportion of 10 per cent by weight of the crystals Into this melted mixture he dropped pieces of silk of sunable lengths wound upon squares of cardboard, and allowed them to remain there until the bubbles of air ceased to rise from the silk as the way permeated its interstices These pieces of cardboard were then picked out of the melted wax, the excess of same allowed to drop off, and when thus drained were put in a proper receptacle and were ready for use Such silk constitutes when prepared to day after modern antiseptic and aseptic technique, the oldest ideal suture - an antiseptic "wax end"

During all these years I have tried every form of suture as it has arisen, only to return to this ideal suture material To-day the sik is cut in proper lengths, wound upon pieces of cardboard which are then folded in pieces of parafin paper and put in an envelope with the size and length of the suture inscribed upon it. These packets are then dry stenlized in bulk in ordinary dry stenlizer. When a sufficient quantity has been made, the enclopes are opened, the silk cards are immersed in the 10 per cent carbolized melted beeswax under the usual modern aseptic precutions, and when saturated are returned to the envelopes. Before using, the silk should be rapidly drawn through a stenle towel. This produces enough friction to partly melt the wax and thus polish the silk, just as the shoemaker

polsibles his wax end.
This suture material then possesses all the
destrable qualities of any suture material. It is
solid like sister wire, smooth like sikhworm,
unirotating, it may be buried, is stronger for the
sace than the unwaxed, and has as its nearest
unitator, Pageostecher linen. It makes the
duel sature for delicate structures like the periduel sature for delicate structures like the periduel stuties for delicate structures like the perifunction that the structure of the period of the
It seems to have just sufficient antigrowthe carbolic acid to period its freening
from to to 14 days without exciting suppuration
if the skim he sterile at the time of insertion.

Emphasis should be laid upon the necessity of securing true beerway, not the "improved" bleached variety which is usually paraffin, as well as 100 per cent phene acid.

"Try all things, Hold fast to those which are true"

LEWIS L MCARTHUR.

BOOK REVIEWS

SURGERY OF DEFORMATIES OF THE I ME BY John B Roberts, A. M., M. D. New York, William Wood & Co., 1912

This volume deals exclusively with surgical deformation of the face and consequently a more careful study of the principles underlying such malformations is undertaken than its seen in works on general surgery.

The first chapter is historical and refers to publications of methods and successes of Taghi cozza of Boligman is 1597. Reference is made to rhinoplastic and other operations which were practiced in fully centures before where muttlations of the face were in vogue as a punishment for

Considerable space is given to the study of the facial anatomy and contiguous parts which influ

ence surgical interference.

Surgical skin diseases are discussed with ilcform titles of the mouth lips, and ears as well as comilitions resulting from faulty development along the

various clefts, especially of the prilate and lip.

In general, well known operations are described, and the results attained by the author in this special field are reported.

H A Poirs

SURGICAL DISEASES OF CHILDRIN By Wm Francis Campbell, M. D., and Le Grandt Kerr M. D. New York and London D. Appleton & Lo. 1912

This book contains many things which will be of great use not only to the man practicing surgery but to the man practicing godistries. Symptomatology is gotten into highly, especially with regard to those specially with the special containing the second of the second property of the second of th

The rest of the book is taken up with the various surgical procedures in regard to diseases which occur more frequently in children and stress is laid on those conditions which are most frequently encountered or are peculiar to this time of life. The book is well flustrated, very complete, and can be recommended to one engaged in almost any general or special practice in medicine. C G GRUST.

AN ESTRETICS AND THEIR ADMINISTRATION 41h edition
By Sir Frederic W. Hewitt, M. V. O., M. A., M. D.
London Macmillan Co. Ltd., 1912

This volume is without doubt the best and most complete on the subject of anissthetists to date, and store the subject of anissthetist to date, and some than a passing notice of sussellation one of the most important brainches in the department of surgery. It is handled to best advantage under well selected topics each chapter approaching it from a different standpoint. The chapter on the evolution of anisthetin is fairly complete but a volume of this size should deal more fully with the scientific apparatuses that are now in use which deliver accurate perculages of our methods which deliver accurate perculages of our methods of the sequently a more quitted and the consideration of the sequently a more quitted and the consideration of the sequently a more quitted and the consideration of the sequently a more quitted and the consideration of the sequently as more accurated to the sequently as more accurated to the sequently as t

I believe also that too much space is devoted to the advocacy of chloroform and formulæ containing this drug and too little to the harmful after-effects which it is well known to produce

The chapter on the Physiology of Anaesthetics is interesting and practical for the student, particularly the discussion of the muscular phenomena in surgical anaesthesia.

In the chapter on Morphin and other Alkaloids in Conjunction with Anaethetics, the author correctly takes the position that preliminary nervoites in properly selected cases are a distinct advantage to the patient taking an anaethetic.

His chapter on the Caustion and Treatment of Respiratory and Circulatory I ailure is well written and how to meet the contingencies is well illustrated throughout the text by clinical data which the author has so abundantly supplied from his case records

Speziei Le Chire reische Diagnostie für Studierende und Aerzte grd edition. By Dr 1. de Quervain Leidzig. F. C. W. Vorrel

The third edition of this valuable bool, coming so son after the earlier editions, demonstrates the favor with which it has been received by the surgical profession. It is still worthy of many editions and is recognized to day as one of the best volumes upon surgical diagnosis. The present edition is enlarged earlier to the present the been rearranged to bring them to chapters have been rearranged to bring them to chapters with the company of 170 pages, well allustrated and clearly a written, and should be in the hands of every American surgeon who is familiar with the German language.

SURGICAL AFTER TRIVING A manual of sur_acal convalencence By L. R. G. Crandon, A. M. M. D., and Albert Ehrenfried, A. B., M. D. Philadelphir and London. W. B. Saundurs Co., 1912.

This second edition contains not only the revised text of the first edition but much subject matter which, according to the consensus of opinion, has marked an advance in surgical mactice.

This volume is of value to hospital internes whose training in after treatment and recognition of sequelar is quite largely traditional to the hospital in which this are engaged, and will serve to broaden their comprehension and experience, being based as it is upon the experience of other men whose work has been in other hospitals. To the physician practicing in the country and smaller towns away from surgical centers where the surgeon relies largely upon the house physician to observe the patient after operation, these methods and suggestions are of especial value, as many times the our geon who operates cannot rem up to take care of the case. The chapter on vaccine therapy is written by Dr Gen It Santiorn a pupil of Ser & F Whight which fait besinals its scientific and prairtial wath

HA OTIS

The Collectio Works of Christin Lingle M D
Two volumes Philidelphia and London W B
Saunders Co. 1840-1012

The appearance of this work, which somes is the expression of the afficiential electrons of the Feingr Memorial. Association, established to perpetuals the memory of this grist man is segnificant of the idealism of our noble profession. We must typical that, in the midst of supportation which is accusation of a personal and insistent character there are evuluates now, and then in deep and spontations feeling in the cummon recognition of time grist insistence.

Dr. Lenger s life was one of great activats in the cause of suffering humanis. Brit stang the attitude, of scientific investigation and suils his was able to do be work, and not the oversthem die he is made which must come to those who was at close hand and lied practically with the alternets of humanis. Dr. Longer had a heart as tender as that of a woman and when great missistume came to his surpressed efforts he knew how to give was said indirectly the hard permitted to men.

No medical man should fail to read the remarkable autohography that this great man write fir the Dunish Government upon the occasion of his receiving the Order at the Knight of Dinnelworg.

The estimation of the value of Fenger's work will be the agreeable task of succeeding generations of students of his papers and of the history of American and universal surgery

Like all great men, he was really greatest in him

self and to know him was infinitely more than to know all his work. To grap his persustent effort to maintain an attitude of strict organifor the enentire truth was far more of an electrost not than the study of his wonderful papers, the observation of his parmaking care of his patients or the following of his exturnous into the hild of surgial theory and achievement.

For no one who knew him could possibly forget his entire honesty of thought and action. Truth for him was of far more importante than success. His statistics id his own work ware presented may such a frunkness as to inspire every man who had a covered of his home when

spark of bledbom in him. It was length of the hought with the betters of modern surgery, those also have sectioned their whole has a blas and might, see sectioned their whole has a blas and might, see the section of the work which he had been as the masterial was which belings to surgeons in the masterial was which belings to surgeons the section of the work at Diefferhish Langeitheck, billitroit. Paths Office: I he long has of go mecologists our American McDowell mining the first French which was the high produced the section of the work which was the section of the work of the wore of the work of

Feager reported in his old world origin, though he spoke little oil it and never with the least offense, and was then wnethils an American juonier surgeon He could never grasp the genius iii America but retained a curious than race of attitude and demeanit in the end. He sympathized with us and our dubuultes to the utmost and intered wholehearteilly and sweetly into their solution. Nothing rould be mure all like than the long struggle which he made with his broken I nglish his answard manners and his penerty to good entree into the contidence of the American medical profession During this long period it was quite enough for him to do each day a nork as it came. He nivit carried out a little work never write a magnum open but lived and wrought in the contilence of the value of his dinh labor

It is because he rated so this cloud the shows side of his work so much for its freque mening and inherent truth that his pupils therish so strong an affection and revenuer for him and have glidly co-operated to this production of these volumes.

Prof Hikkner and Dr. Butord district the thanks if he whole profession for their silf Straffee in doing the work which was required. The amount of effort most ed is by more so mans, appraint upon a first glance at the books, since so much in the wity of exting but to be done. We third fore all the more feel our obligation to the elitors and brapeak for them the gratiqued of all tradiers.

The collected works of Christian Leager deserve a place in the library of every thoughtful surgeon and physician heside the Autobiography of Marion Sums and the Letters of Heodori Billroth

WELLIE LAN HOPK

Clinical Congress of Surgeons of North America

FOURTH ANNUAL SESSION CHICAGO NOVEMBER 10 TO 15, 1913

CLINICAL CONGRESS OF SURGEONS OF NORTH AMERICA

EDWARD MARTIN, President Grorge I. Brewer, President-Elect W. W. CHIPMAN, Vice-President-Elect FRANKLIN H. MARTIN, General Secretary

ALLEY B KANAVEL, General Treasurer A D BALLOU, General Manager

COMMITTLE ON ARRANGEMENTS FOR THE CHICAGO MEETING

C Wallas Andrews, Chairman

FRINK I ANDRERS CHARLES S BACON W. L. HAPE CARL BECK JOSEPH BECK I REDERIC \ HINLEY ARTHUR DEAN BLAN LENIS II HELVERNIS TRUMES W BROPHS THE HERRY II R (mstrff WM R CIBBINS

CHARLES DAVISON JOSEPH B DELLE PHILIP S DOINE II I LEBELL DOPLAND DASHE V LISENDRATH I won take ROBERT T GILLMORI D # Grann 1 | HALSTEAD I VILLIARIE HORDIE M I Ilvanis

L HERTOES CHARLES L KARLER ALLES B KANNEL DESS D LEUIS GEORGE P MIRQUIS FRANKLIN II MARTIN I. I. MC VARIETA I REDERICK MENCE JOHN B MERRY YORAL II PIERCE

JOHN L PORTER HOLLIS E POTTER FORIS W RYERSON LOUIS I SCHWIDT W. E. SCHROEDER
D. V. K. STEELE
GEORGE F. SCHER
THOMAS J. WATKINS I CLARENCE WEDSTER Nu II SILDER (15E) \ \\ 000

PREPARING FOR THE CLINICAL CONGRESS IN CHICAGO

CAINCE the first session of the Clinical Congress held in Chicago in November, 1910, this city's clinical facilities have been very largely increased through the erection of new hospitals and the enlargement and improvement of older institutions Naturally, its capacity for entertaining visiting surgeons is likewise increased

The clinicians of Chicago fully appreciate the advantages and also the responsibilities connected with a session of the Chnical Congress and are determined that nothing shall be left undone to maintain Chicago's prestige as being the leading

surgical center on this continent

On the following pages is presented a preliminary or provisional outline of the clinical program for the fourth session of the Congress to be held in Chicago, November 10th to 15th, 1013 The several committees having in charge the work of arranging the various sections of the program report their work as only fairly started. The program as here presented therefore is not complete as to the number of operators or the number of clinics to be held by each. The

program is to be corrected and amplitud until a full representation of Chicago's clinical facilities to made

The Historical Committee has in preparation a series of papers dealing with the men and institutions which have helped to make Chicago world famous as a medical and surgical center. In an early asue there will be presented sketches of the lives of the early day surgeons, to be followed by papers dealing with its medical schools, hospitals, laboratories, societies, etc

The Committee on Evening Meetings expects to present at an early date a preliminary outline of the programs for the evening sessions. Several prominent European surgeons have accepted insitations to read papers before the Congress and in addition a number of well known American surgeons will participate. It is planned to have sessions on every evening except Saturday, November 15, and on Tuesday, Thursday, and Friday evenings there will be separate meetings for those men who are especially interested in surgery of the eye, car, nose, throat and mouth

SURGICAL CLINICS

COMMITTEE A J OCHSNER, Chairman, CARL BECK, TREBERIC A BESLEY, and LAWRENCE RYAN

Monday, November 10th

\ | OCIISNER - Augustana Hospatal - 8 to 1 \ P | HLINECK - Jellerson Park Hospital - 10 to 12 G | HYNTKOOP - Lake View Hospital - 10 to 12 E WYLLYS ANDREWS - Michael Reese Hospital -

I MANUEL TRIEND - Michael Reese Hospital - 9 toII

CARL BECK - North Chango Hospital - o to 11 EMIL G BECK - North Chicago Hospital -o to 11

Banuth work only
Banuth work only
M. L. HARRIS — Policine Hospital — 9 to 11
NORMAN KURK — Policine Hospital — 1
NORMAN KURK — Policine Hospital — 2
NORMAN KURK — 2
NORMAN KURK — Policine Hospital — 2
NORMAN KURK — 2
NORMAN KU ARTHUR DIAN BLAAN - Presbyteman Hospital -

G RULORD - St Joseph's Hospital - 2 CARL WAGNER - St Joseph's Hospital - to to 1°
IN ALLPORT - St Luke's Hospital - 2
The LANGE West high Hospital - 2 1 DAVIS - West Side Hospital - 1 to 1 I A LOWLER - Willard Hospital - 11 to 12

Tuesday, November 11th

N. M. PERC\ — Augustana Hospital — 8 to 10 G BUFORD - Children a Memorial Hospital - 2 C G BOFORD — Columbus Hospital — 8 to 12
LWRINCERIAN — Columbus Hospital — 8 to 12
LWRINCERIAN — Cook County Hospital — 8 to 14
G ZIMIR RAINY — German Hospital — 9 to 12
PAUL GRONNERUD — German Hospital — 10 to 12
C I WYNENOOP — Lake View Hospital — 8 to 10
F WYLLYS ANDRUMS — Merry Hospital — 8 to 10 A GREENSFELDER - Michael Reese Hospital - 8 to to McARTHUR - Michael Reese Hospital - o to 11

L McARTHUR — Auchael Neese Hospital — 9

N EISENDRATH — Michael Reese Hospital — 9

EMANUEL 1 RIEND - Michael Reese Hospital - 9 to 12 CARL BECK - North Chicago Hospital - 9 to 11 EMIL G BECK - North Chicago Hospital - 9 to 11

Bismuth work only WM R CUBBINS - Post-Graduate Hospital - 2 to 6 C II MCKENNA—St Joseph's Hospital—9 to 11
C M MCKENNA—St Joseph's Hospital—9 to 11
A E HALSTEAD—St Luke's Hospital—8 to 12 AXEL WERELIUS - South Shore Hospital - 9 to 12 SCHROEDER - Wesley Hospital - 8 to 10 \ BESLE\ - Wesley Hospital - 10 to 12

Wednesday, November 12th

A G ZIMMERMAN - Alexian Brothers Hospital --

A J. OCHNER - Augustana Ho-pital - 8 to 1 WM FULLER - College of P and S - 1 to 3 WM M HARSHA - College of P and S - 1 to 3 CARL BLCk — Cook County Hospital — 1 to 4 J V FOWLER — House of Correction — 9 to 11 E 1 TORELL — Lake View Horn-17 G II WYNELOOP - Lake View Hospital - 10 to 12 I B MURPHY - Mercy Hospital - 8 to to 12

E WYLLYS ANDREWS - Michael Reese Hospital -

I'MANUEL TRILND - Michael Reese Hospital - 9

CARL BECK - North Change Hospital - 0 to 11 R PLNNINGTON - Policinic Hospital - 2 to 5 AWRENCE RYAY - St Anthony's Hospital - 10 to

CARL WAGNER - St Joseph's Hospital - 10 to 12 A E HALSTLAD - St Luke's Hospital - 8 to 11 CHARLIS DAVISON - University Hospital - 1 to 3 A P HEINECK - West Side Hospital - 8 to 10

Thursday, November 13th

N M PIRCY - Augustana Hospital - 8 to 10 A J OCHSNLR — College of I' and S — 1 to 3

M PLRCY — College of P and S — 1 to 3

JACOB FRANK — Columbus Hospital — 8 to 12 LAWRENCE RY IN - Cook County Hospital - 8 to

I WILLIS INDRIWS - Cook County Hospital - 0

P III IN Ck - Cook County Hospital - 1 to 3 I G ZIMMERM IN - German Hospital - q to 12 PAUL GRONNLRUD - German Hospital - 10 to 12 I R CHISLLTT - Hahnemann Hospital - 8 30 C E & MILL&L - Hithnemann Hospital - 8 30 C I WYNTKOOP - Lake View Hospital - 8 to 10 CARL BI CK - North Chicago Hospital - 9 to 11 I MIL G. BECK - North Chicago Hospital - 9 to 11 Bremuth work only

M L HARRIS - Polichme Hospital - 11 NORMAN KLRR - Policlinic Hospital - 11 ARTHUR DI VY BLAAN - Presbyteman Hospital -

11 to 1 C II MckENNA - St Joseph's Hospital - 10 to 11 G BUFORD - St Joseph's Hospital - 2 A F IIALSTEAD - St Luke's Hospital - 8 to at II ALLPORT - St Luke's Hospital - 2 AXEL WERELIUS - South Shore Hospital - Q to 12 DAK STEELE — University Hospital — 1 to 3 FA BESLEY — Wesley Hospital — 4 to 6 C C ROGERS - Willard Hospital - 10 to 12

Friday, November 14th

A G ZIMMERMAN - Alexan Brothers Hospital -0 to 11 J OCHSNER - Augustana Hospital - 8 to 1 A BESLEY - Cook County Hospital - 10 to 12 A F HALSTEAD - Cook County Hospital - 10 to 12
G H WYNEKOOP - Lake View Hospital - 10 to 12.
F WYLLYS ANDREWS - Mercy Hospital - 8 to 10

A GREENSFELDER -- Michael Reese Hospital --8 to to L L McARTHUR - Michael Reese Hospital - 9 to 11 N EISENDRATH - Michael Rrese Hospital -o to

EMANUEL TRIEND - Michael Reese Hospital - 9 CARL BECK - North Chicago Hospital - 9 to 11. R PENNINGTON - Polichnic Hospital - 2 to 4

CARL WAGNER - St Joseph's Hospital - 10 to 12

W. E. SCHROFDI R - Wesley Hospital - S to 10 VLLINBANNIII - Wesley Hospital - 4 to 6

Saturday, November 15th

N. M. PLRCY - Augustana Hospital 8 to to F G DVAS - College of P and S -- 1 to 3 I VCOB I RANK - Columbus Hospital - \$ to 22 WYLLYS ANDRIWS - Cook County Hospital Q to 12 C I. HUMISION - Cook County Hospital - 10 to

12 PAUL I MORI Cook County Hospital - 1 to a A G /IMMIRM IA -- Gurman Hospital -- a to 12 H R. CHISLETT - Habiti mann Hospital -- \$,30 C. F KAIHAF - Habnemann Hospital - 8 10 C I WIM KOOP - Lake View Hospital - 8 to 10 II A MOJt - Lake View Hospital - 10 to ti J B MURPHY - Mercy Hospital - 8 30 to 12 CARL BI Ck - North Chicago Hospital - 0 to 11 1 MH G BI Ck - North Chicago Hospital - 0 to 11

Bismuth work only DMH. - Nurwegian Diaconess Hospital - 0 to 11 PAUL GROAM RUD - Polichnic Hospital - 2 to 4 D W GRAHIM - Pre-byterian Hospital - 2 to 5 W H ALLFORT - St Link's Hospital - 2 VII WIRILIUS - South Shore Hogatal - 9 to 12 W L CHROI DI R - Wesley Hospital - 10 to 12

GYNECOLOGICAL AND OBSTETRICAL CLINICS

COMMITTE J CLARLACE WIDATER, Churman LEANE T ANDREWS, CHARLES & BACON and THOMAS J WATKING

Monday, November 10th

HENRY HANGA Publime Hispard - 10 THEODOR! J DOI DI RELLY - termin History -

IRANK T ANDREMS Mercy Hospital 8 to 10 LVIII. RIFS - Post Gruluite Hospital o WVI II I I II RIND Rush Medical College 11 ARTHIR II CURTIS Wesley Hospital - 9 ROUI KT F GILLMORI lle-ley Hospital - 10 MARK I GOLDSTINI Winks Hospital - to 30

Tuesday, November 11th CHANNING W BARRI FF Policians Resertal - 10

ALBERT GOLDSPOIN For Graham Hopetal — CARTA CULBERTSON Rush Medical College— WM THOMPSON St Joseph's Hospital—o PHILLES DOXIA St Joseph's Hospital—a to WS RAKNIS—Weeky Hospital—a Rush Medical College - 11

Wednesday, Agrember 12th

III.NR\ I LI WIS - Cook County Hospital - 3 30 LLSTLR TRANKI NTII VI. - Michael Reese Hospital FRANK W LANCII Pre-Interim Hospital - 31 J. CLARINGS, WIBSHIR - Pre-byterian Hospital-N SPROAT HEAMLA - Rush Medical College - 11

I' C DUDLIA - St Luke's Hospital ARTHUR II CURTIS -- Wesley Haspital - o MARK T GOLDSTINI - Wesley Hospital - 10 30

Thursday, November 1 th A B KIYLS — Cook County Hospital — 3 to 4 IRANK T ANDRI WS - Very Hospital — 8 to 10 IENRY BYNG V = Polichnic Hospital — Afternoon
HENRY BYNG V = Polichnic Hospital — 10
CH VNING W BARRLIT — Polichnic Hospital — 10

WM B HIRRNG - Rush Medical College - 11 PHILIP'S DOANL - St Joseph's Hospital - 2 30 W S BURNES - Wester Hospital - 3 ROBERTT GILLMORF Wesley Hospital - 10 THOS J WATERS Wisley Hospital - o

Friday, November 14th

V B KLVIN - Policinic Haspital - 4 to 4 AIBERT GOLDSPOIIN Post Graduate Hospital -CARTA CULBERTSON

Rush Medical Cillage - ti W M THOMPSON M Joseph Hospital o Saturdas, Vosember 13th

HATER IRVNES FILM Muhael Reese Hospital IRANK W LANCII Presbyteri in Hospital - 11 J CLARI NO WERSTER Presbyterian Hospital -

S. SPROAT HE AND Y Rush Medical College THOS I WALKINS Wesley Harpital

Days and Hours to be Innounced

CHARLES BY ON 1 5 BAILI 1 - Hahnemann Hosuit il HENRY F BYLORD West Sule Hospital

FRANK CARTA PLITES CLIEK JOSEPH B Det El - Mercy Hospital Wesley Hospital
R A M W.M N DORI A D

DALIS S HILLIS - Provident Hospital J C HOVG St Luke's It reputal KUDOLPH W HOLMES Ingustant Hospital GUSTAN KOLISCHER TRANKLIN II MARTIN

B A MCBURACI CHARLIS F PADDOCK St. Luke - Huspital CHARLES IC RI LD - Wester Huspital

TRYEST SAURFAHAUS West Sale Hospital GEORGE SCHMACCH I S SEMON - Michael Reco Hospital

HERBLET MARION STORY BIRTHA VAN HOOSEY West Side Hountal

GENITO-URINARY SURGICAL CLINICS

COMMITTEE TOUR I SCHMINT, Chairman, MM T BELFIELD, ROBERT H HERBST, GUSTAN KOLISCHUR, VICTOR D. I-ESPINASSE

Monday, November 10th

GUSTAV KOLISCHER - Michael Reese Hospital -0.10.13

Tuesday, November 11th

RERMAN L KRETSCHMER - Meyan Brothers Hospital - 8 to 10

B C CORBUS - College of P and 5 - 8 to 10 HARRY A KRAUS - German Hospital - 4 to 5 F KRLISSL — Jefferson Park Hospital → 2 to 3 ROBERT II HERBST - Polichme Hospital - 4 to 6

Wednesday, November 12th

L F SCHMIDT - Menan Brothers Hospital - 9 to 17 F KKLISSL — Jefferson Park Hospital — 2 to 3
GUST W KOLISCHER — Michiel Reese Hospital — 9 to 11

Thursday, November 13th

F ARFISSL — Jefferson Park Hospital — 2 to 3 ROBERT II HERBST — Policlinic Hospital — 4 to 6 I S NAGEL - West Side Hospital - 3 to 5

Friday, November 14th

HERMAN L KRITSCHMLR -- Mexian Brothers Hospital - 8 to 10 II ARRY A KRAUS - German Hospital - 4 to 5 F KREISSL - Jefferson Park Hospital - 2 to 3 LOUIS E SCHMIDT - Muchael Reese Hospital - o to

11 B C CORBUS — Past Graduate Hospital — 3 to 6
WM T BELFIFED — Presbyter in Hispital — 4

Saturday, November 15th V D LESPINASSE — Wesley Haspital — 3 30.

ORTHOPEDIC CLINICS

COMMITTEE E W RYERSON, Chairman, Wallack Blanchard, Charles M Jacobs John L Porter and Henry B Tuonas

Monday, November 10th

E W RVERSON -- Children's Memorial Hospital --3 to 6, Policime Hospital — 1 to 2
THOMAS P LYNM — Home for Oestitute Croppled Children - 2 to 4

Tuesday, November 11th JOHN L PORTIR - College of P and 5 - o to 12 Home for Destitute Crippled Children - 11 to 1

WALLICE BI ANCHARD - Home for Destitute Il ednesday, November 12th

E W RYFRSON - Children's Memorial Hospital - 3

Crippled Children - 2 to 4

to 6 Policlinic Hospital - 1 to 2 MAGNUSSON - Home for Destitute Coppled Children - 2 to 4

Thursday, Notember 13th HENRY B THOM 15 - Cook County Hospital - 11 to

L W RYERSON - Home for Destitute Crippled Children - 2 to 4

Friday, November 14th

WALLACI BLANCHARD - Home for Destitute Crospled Children - z to 4

F W RYERSON Polichnic Hospital - z to 3

Saturday, November 15th

C. M. JACOBS - Home for Destitute Crimted Children -2104

OPHTHALMOLOGICAL CLINICS

COUMITTEE WM II WILDER Chairman, FDWARD V L BROWN and CASSILS WESTCOTT

Monday, November roth

WILLIS ON INCE - Illinois Chirtable Lye & Ear Internate - 7 30

G W MARONEL - Policina Respitat W JRANK COLIMAN - Post Graduate Hospital - 4
WILLIAM II WILDIR - Rush Medical College -2 30

Tuesday, Varenther 14th

CHARLES II BEARD - Blances Charmable I ve & I ar Intirmity -- 2 to

CHARLES II FRANCIS - Policinic Hospital - 9

GIORGE F SUKFR - Post Graduate Hospital - o

Wednesday, November 12th

I B LORING - College of P and S - 3 OSCAR DODD - Illinois Charitable live & Far Infirmary — 2 30

MEAD HAGER — Polichnic Hospital — 0

FRANK COLI WAN - Post Graduate Hospital - o GI ORGI I SUKI R - Post Graduate Hospital - 2

Thursday, November 13th

WM II WII DI R - Illin as Charatable Tye & Lar II reputat -- 2 to G W WWIGNIA - Pulseba a II septat -- 0

I riday, November 14th

II. W. WOODRI I - Illinois Chintable I se & Lac

| Hospital = 2 to | CHARLES H TRANCIS = Polishing Hospital = 2 | W TRANCOLLAND | Post Graduate Hospital = 2

Salurday, November 15th

1. V. L. BROWN — Binory Chantal & Lie & Lar Hos
pital 1 19

S MI AD HAGER - Policing Hispatal - 9 GIORGE 1 SCKI & - Post Graduate Hospital - 9

The distance modification

Days and Hours to be Announced Later
C GERMI TELLINGS—Habnemann Boopital
RIGHARD J TANEN—Mercy Dopital
MURTIMI R EKANG—Mohael Reset Boopital
L L-NADAGER—Unbed Reset Boopital
L L-NADAGER—Unbed Reset Boopital
RIGHMAN AND AST — Northwestern Linguistics and We bey

H spital

CMA V MODD—St Tuke H spital

KANK MATCHET — St Luke H spital

CMSUS D WISCOTT — St Luke slive tal

WW L GAMBII — Inneresty H spital

LARYNGOLOGICAL AND RHINOLOGICAL CLINICS

Convitted Tempera Mesor Charmas, Mar I Barres or and Jans Louis Annua.

Monday, November 10th
SLANTON V I RILDBI 60 - Cold County Houstal

CHARLS W KORI KISON Parker Hogard

Tuesday, Amember 11th

JOSEPH CHICK Code (comp. Ho. pital... to 6 OFFO T TREER Politics Hospital... 4 to 5 CHARLES H. 10 No. Tone (chadrate Hopital... 5 to 12

Bednesday, November 12th
BURION HANT TIME Habiterian Hapital
alternom
OFFOL STILL Bot Gradue Hapital 2005
IR DERICK MINGL World Hapital 2005

Thursday, Amember 1 ph

JUST PHECK TO A COURTS HE STATE A TO BE RECHARD H. 64,000 N. Culters of H. and S. Sopratt. J.

Killitonouciti, Chilici

CHARLE M. ROBLETON Pricing fleg tale-1 10 to C. CHARLE H. LONG. Let Graduate Hispanis S 30 Const.

Iridas, Vinemler 14th

SINION A TAILIDDESS - Con County Beyond
202
OHO FIRIER Baldon Beyond 4 to 5
WWI BALLINGER College Changes 19912

Saturday, November 15th

JOSEPH C. B. CK. - Co.A. County II spiral - 1106 CHARLES H. EUNE - Post Graduate II spiral - 5 Jo ARTHER M. CORNEY - Waste I. II spiral - 8 to

Days and Henry to be Amount of Later IRANA 2 BRAWITY SCIENCE Heapth WIRTIM REPORT White Rees II optal HOFFOR SCIENCE William To GLORGE F WARDLES SCIENCE II optal IGINAL RUBBLES Frobustoral Reputal

ORAL SURGICAL CLINICS

Countries Trents W Baorin Chairman Fromst L Girster and We II & Locks

Days and Hours to be Announced Later
ARTHURD BLACK ST Lule's Hapital and North
written Conversit Divid School
HIOW S. L. GILWI R. — St. Lule a Hospital and North
western University Dental School

HIBBERT A 194148 Northwestern Lowersaty Bernats Abrid IAI MAN M. IRBOPHA Perslavterian Hospital and Leners Wilder Hought LERICK R. MOOREHRAD - Presbyreran Hosnet L.

Will G LOGY | Lan is Wilcold Depital

SURGERY, GYNECOLOGY AND OBSTETRICS

AN INTERNATIONAL MAGAZINE, PUBLISHED MONTHLY

VOLUMT XVI MAY, 1913 NUMBER 5

ON THE INDICATIONS AND RESULTS OF THE EXCISION OF POSTERIOR SPINAL NERVE ROOTS IN MEN

By PROF OTFRID FOLRSTIR BRESLAL, GERMANN

THE first indication for the excision of the posterior spinal nerve roots is based upon the physiological function of the same, as conductors of the sensibility, and is formed by trolent neuralgic pains, which defy other methods of relief The first to recommend this operation for the relief of pain in a case of ascending neuritis was Dr Dana of New York in September, 1888, and the operation was carried out by Robert Abbe in December, 1888 Some time before, Sir William H. Bennett of London had divided. in a case of severe sciatica, five posterior lumbar and sacral roots. Since then, this operation has been performed for the relief of pain in a great number of cases If I sum up all those published until now and five personal cases operated by Kuttner, Tietze, Gottstein, and myself, they amount to 44 cases, as shown in Table I Six died of the immediate effects of the operation and seven succumbed sooner or later to the progressing disease, only in one case was injury produced, namely Brown Sequard's spinal hemiplegia, which decreased later on

As is shown by Table I, in 22 cases the cervical roots were cut, in eleven cases the thoracic, and in eleven cases the lumbar and sarral roots

As to the cause of the pain, it was questionable in 15 cases of so-called plexus-neuralgia, the nature of which mostly cannot be recog-

nized with certainty In a great number of these, amputations of the limbs and operations upon the peripheral nerves had already been performed

been performed.

Nerve injuries of traumatic origin were the cause in 5 cases, pain caused by athetoss in one, neuritis consequent on arterio-clerosis in 2. pain owing to herpetic neuritis in 2 cases, sphilitic radiculitis in 2, arachmits in one case, cancer or sarcoma, either in the body or in the vicinity of the brachial plexus or in the vertebral column, in 7 cases, severe pain after phlebitis in one case; tuberculosis of the hand in one case; and, finally, lightning pains in tabes in 7 cases

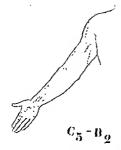
TABLE I

Root resection for the relief of pain
44 cases, 6 deaths Cervical roots, 22 cases,
thorace roots, 11 cases, lumbar and sacral roots,

thoraca roots, ir cases, tumour and s	sacrai roots,
	Cases
Plexus neuralgia	15
Traumatic neuritis	ž
Arteriosclerosis	2
Herpetic neuritis	2
Syphilitic radiculitis	2
Arachnitis	r
Cancer or sarcoma	
Phlebus	7
Tuberculosis	1
Athetosis	1
Tabes	1

Results Successful, 12 cases, failures, 23 cases; result unknown, 3 cases

Read before the Third Chuntal Congress of Sangrous of North America. New York City. November 2, 1912



• - -

As to the results of the excision of the roots in all these cases of the 38 survivors, only 12 were considerably benefited, but we must say that the time of observation has been very short in some cases In 22 cases there was very little or virtually no relief from pain, and in three cases the result has not been communicated . Imong the successful cases, three are particularly striking because only one root has been divided namely in the case of Ballence, the first thoracic, in the case of Chipault, the eighth cervical; and in the case of Horsley, the first sacral Evidently only this single root was affected, which explains the lasting result The failure is comprehensible in the cases of metastatic cancer of the vertebral column, since, owing to the progressing disease, other roots were subsequently attacked In the majority of all cases the failure was due to not having excised The more roots cut, the greatenough roots er the continuous result, as, for instance, three cases in which the fifth to the eighth cervical and the first and second thoracic roots were But in one case of Hildebrandt even this number of excided roots was insufficient To account for this, we must consider that in the sensory supply of the arm, besides the fifth to eighth cervical and first and second

thoracic roots, the third and fourth cervical and the third thoracic roots take part too. If only the fifth to the eighth cervical and first and second thoracic are divided, the whole arm does not become anasthetic Fig. 1; shows the large area conserving sensibility. The area insensitive to pain is a fittle greater than that insensitive to light touch

The relations of the leg are similar. In a case of sphilitte radiculitis, in which kuttner and I divided all lumbar and sacral roots, violent pain tecurred in the left leg. Fig 2 shows the large area below the inguinal fold conserving sensibility and apparently supplied by the tenth, eleventh and twelfth thoracir crost.

In the arm as well as in the leg, all rootoverlap each other Until lately it was befieved that a division of three adjoining roots
was followed by an anasthesia of some part
of arm or leg, but it has been demonstrated
by Clark and Taylor and by filldebrandt that
even the division of four or five adjacent
lumbar roots produces no apparent disturbance of sensibility at all 1 may add that
re-section of the fourth and fifth lumbar and
the first and second sacral sometimes renders
only a very little area on the tibla insensitive.
There seems to be a difference in the disturbance of the sensibility if the upper roots are

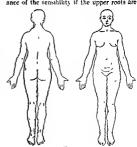


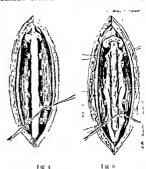
Fig a

resected from the disturbance if the lower

roots are divided. A few words on the cases of tabes with severe lightning pains Against this, as early as 1900, Mingazzini had suggested the resec tion of the posterior lumbar and sacral nerve roots, which, however, was performed only lately I have collected seven cases, in one, cervical roots, in three, thoracic roots, and in three others, lumbar and sacral roots were cut Two cases died, and only in one case. in which Enderlen resected the fifth to ninth thoracie for girdle pain, was a result obtained All other cases were failures the number of roots resected being far too little Particularly important it seems to me, was a case of takes in which Gottstein and I divided the fourth and fifth lumbar and first sacral patient had suffered from a terrible neuralgic pain, confined to a very small spot of the internal malleolus. We believed that this spot was only supplied by the three above mentioned roots We cut them, and for a few days the pain ceased, but then it came back with old violence, not the slightest disturbance of sensibility had taken place



Fig 3 Fig 4



All these quoted cases clearly prove that for a continuous rehel of pain we must cut in any cave a great number of roots, when the arm is the scat of pain, the third to the eighth cervical and the furst second and third thoracia roots, when the leg, the tenth to twelfth thoracia and all his lumbar and all five sacral roots, when the thoracia roots, must be divided any unaber of thoracia roots, must be divided Exceptions are only those cases where a localized affection of one or a few single roots can with certainty be stated

THE SECOND INDICATION

The second indication for resection of posterior spinal nerve roots is the visceral especially the gastric, crises in tabes II is a question here of thoracir roots. The visceral crises are produced by an irritation of the sensory sympathetic fibers of the abdominal organs, passing through the posterior thoracir roots. This irritation is indicated by the dreaded volent pains, the hyperasthesia of the abdominal skin, and the increased abdominal reflex, vomiting and hypersecretion are only a secondary consequence of the sensory irritation. Supposing this point of view to be correct, the crises would cease after the







Γig 7



...

division of the corresponding posterior thoracic roots

This operation has been performed now in 64 cases, six of them succumbed, as shown in Table II, and four others died some weeks or months later in consequence of a pyelitis

TABLE II

Root resection for the relief of gastric crises
Total number of cases
Survivors
Successful
Failures

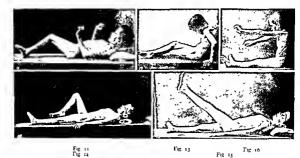
Deaths Number showing no relapse Number showing considerable improvement Fig 8

Fig 10

Among the 58 survivors, 56 cases were successful, and only two were failures from the beginning Among the 56 successful cases, no relapse has been reported in 20, but we must bear in mind that the time of observation in a number of these has not been reported, and in several was short But there exist also numerous cases in which no relapse bas occurred, even after several years Thus, a case operated by Kuttner, which bad been in a perpetual critical state for years and bad already undergone on this account several abdominal operations, has been cured now for four years Another case, operated by Angerer, was observed for 18 months, and gained 48 pounds in weight. In a second case of Angerer, and also one of Moskowicz, the time of observation was over one year; in a second case of Moskowicz, two and one

In 18 cases the crives relapsed, but nevertheless a considerable improvement was obtained, the critical state not having returned
and the criess occurring very seldom and with
only moderate intensity. The patients have

Number showing considerable improvement 18 gained considerably in weight, and a number









115 10

have recovered their activity and their capability for work. In one case of lietze the patient has for the past three years resumed his occation as architect. The tabetic operated by Saucerbunch two patients of Guleke, one of Zinn, and one of Lotheisen, have all taken up their calling again as workmen, mason and commercial travelers. In 6 cases the improvement was not great in 3 only slight, and the last two failed completely



Fig 20

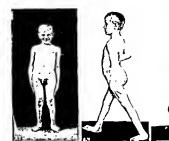


I

As to the cause of the more or less imperfect results, the root resection was not radical in a number of cases The roots are often difficult to recognize and i-olate from the spinal cord, owing to the concomitant arachnitis. Whether the resection has been radical or not is ascertained by the degree and extent of the insensitive area following the operation. Originally I had suggested for gastric crises resection of the seventh to tenth thoracic roots, later on I strictly exacted a more extensive resection. After the radical resection of the sixth to tenth thoracic the insensitive area reaches from the mammilla to the navel, as shown by Fig 3 In lesser or greater resections it is correspondingly extensive. The area in-easible to pain is a little greater than that insensible to touch



I 1g. 22.







Γιg 23

Fig. 24

I 1g 25

Fig 26



Γig 27



I 1g 29



Fig 28.



F 12 30

What about this test in the single caseoperated? Unfortunately, in 25 cases not a word has been stated about this. In 12, it can be proved that the resection was not radical as taught by the degree and extent of anesthesia. I quote only one instance of this; namely, a case of Kuttner's, the Solation of the roots being nearly impossible and a part of them not pointed out

Fig 4 shows the following disturbance of sensibility on the left side, an area having conserved its feeling and being the seat of enormous pain. The crises, however, were removed. In a second operation we extiprated the spinal ganglia appertaining to the missed roots. The pain disappeared and the loss of sensibility became complete.

The second cause for relapse is allied to the nature of the gastric crises themselves. In a certain number of cases, in which the crises are removed completely, intestinal pains



Fig 31

occur sooner or later after the operation; sometimes they are transient, sometimes more lasting. The pains are caused by an affection of the roots above and below those resected, they probably often being irritated by the blood flowing during the operation into the not of the arachnoidea. If this irritation is more pronounced, real gastric crises may return.

The system of roots carrying the sensory sympathetic nerve fibres of gastro-intestinal origin is very extensive, it exceeds surely the seventh to tenth thoracíc, and probably the seventh to tenth thoracíc, and probably the fifth and sixth, as well as the eleventh and twelfth and the first and second lumbar roots are still concerned. Within this province, these now will be the source of the crises. In many cases, the affection of just the seventh

to ninth or the tenth thoracic seems to have been the origin of the crises; in other cases, surely other roots participated. A case of Guleke is very interesting in this respect. At first the seventh to ninth thoracic were resected. The crises ceased, but returned later on; then the tenth and eleventh were cut, and the crises disappeared again. Never knowing exactly which roots are especially affected and causing the crises, we have to resect as many thoracic roots as possible, The excision of the whole system, from the fifth thoracic to the second lumbar, will hardly ever take place; but seven roots should, if possible, be cut. The extent of the hyperresthesia of the skin and the exact seat of the pain may serve as a criterion, whether the upper or the lower part be chosen.

Rearing in mind the great extension of such resection, we are obliged to be cautious, and to operate only in severe cases resisting every other treatment. In order to simplify the operation, Guleke has suggested not opening the dura and resecting the roots close to the spinal cord, as is usually done and shown by Fig. 5, but picking up and cutting the roots in their course outside the dura, where the anterior and the posterior roots are both enclosed in separate sheaths, as shown by Fig.

closed in separate sheaths, as shown by Fig. 6. Franke has proposed, instead of resecting the roots, that, after exposing the corresponding intercostal nerve, the spinal nerves be tentised out with the ganglion. He has applied this medification three times, twice successfully, the third case died Leriche had success too; Clairmont reports two complete failures. This proceeding of Franke's exclusively a technical modification, and is subject to the same consideration as the original proceeding of root resection.

One last point must be considered with respect to gastric crises. Not all crises proceed from an irritation of the sensory sympathetic fibers passing through the posterior thoracic roots, but sometimes from the pneumogastric nerve. This nerve also carries sensory fibers of the abdominal organs. I have proved this in cases of complete section of the spinal cord in the upper thoracic or the cervical region. The crises originated by irritation of the sensory pneumogastric nerve

fibers show no pain, but a very pronounced nausea. Exner has divided the pneumogastric just below the diaphragm, and has performed this four times; one case died, and three were successful. Ranzi reports three cases — two successful, one not; and Kuttner reports a complete failure.

The division of the pneumogastric nerve below the diaphragm does not remove the irritation of the sensory fibers of this nerve, which is situated either in the jugular ganglion or between this and the medulla oblongata. Here the operation has to take place. But the vagotomy does remove the hypersecretion of the stomach, the vagus being its most important secretory nerve. This explains the results of Exper's operation

THE THIRD INDICATION

The third indication for resection of posterior roots is spasticity and spastic paralysis due to a disease of the corticospinal path, especially the pyramidal tract. I will not here recur to the physiological point of view and the pathologico-anatomical facts which have led me to propose the resection of posterior roots for the relief of spasticity. But I cannot forbear mentioning that as early as 1904, Munro, as I have learned lately, cited Little's disease and spastic palsy as indicating division of posterior roots, without entering into a more detailed analysis. I first give a review of the cases hitherto operated, and shown in the following table

TABLE III

Root resection for the relief of spasticity

159 cases, 14 deaths

88 cases congenital spastic paraplegia 3 cases hydrocephalus.

8 cases mfantule spastic paraplegia. 4 cases traumatic spinal spastic paraplegia

reases traumatic spinal spastic process traumatic spinal spastic process.

I case Potts' disease.

6 cases syphilitic spinal spastic paraplegia.
11 cases disseminated sclerosis.

23 cases spastic arm paralysis.

I have collected 159; 14 died, thus making a mortality of 88 per cent. The mortabty appears still less when considering the results of a single operator like Kuttner, who had only 2 deaths among 31 cases op-

crated for spasticity. Both were children with severe epilepsy; an epileptic attack to-lowed the first stage of the operation. Since other authors relate the same cause of death, I am inclined to exclude from operation cases of spastic paralysis with frequent epileptic fits. Likelsberg had no deaths among 12 cases. I counted 88 cases of congenital spastic paralysis treated by resection of posterior lumbar and saveral coots, with 6 deaths. In a large majority the results have been satisfactory, part even excellent. The causes of failure will be discussed later on.

I should like to demonstrate to you, in pictures, the extent of the improvement in some cases operated by Küttner and treated by me.

CASP 1 Boy, age 7 Severest rigidity of the limbs (lig 7), unable to make the slightest volum tary movement - to sit, stand, or walk, the patient lay in bed like a log freimmary on hopedic treatment, consisting in tenotomy of the Achilles and adductor tendons, had been absolutely of no avail In consequence the legs were now held in extreme abduction (Fig 8), with the same nigidity as they had previously been held in adduction. The result of the operation of tool division was immediate cessation of the spasms and the return of voluntary The boy moves his legs freely, he even lifts one leg without any assistance (Fig 9) he can stand erect with straight knees unaided (Fig. 10), and walks quickly and safely on two crutches without any help. The improvement was maintained under suttable exercises, and is still going on of observation, over four years

CASE 2. Boy, age 11 Severest ngidity, was able to carry out slight voluntary movements of the legs, but could only bend both legs a little at the same time (lig 11), considerable subsidiary movements being carried out with the arms and head The patient was quite unable to stand (Fig. 12) or to walk, and could not sit up even when assisted (Lig 13), the resistance of the extensors of the pelvis being insurmountable Since the operation the rigidity has quite disappeared, voluntary movements of the legs are carried out freely, the patient being able to bend each leg by itself (ling 14), to lift it up high (lig 15) without also bending the Lnce and ankle joint; he sits up alone (1 ig 16), stands (1 ig 17), and walks alone with long strides (Fig. 18)

CASE 3 Boy, age 10, with severe rigidity of the limbs and contraction of the flexors (1 [g. 19]) Mothlity as in the previous case, the patient was unable to sit, stand or walk (1 [g. 20]). After the operation the spiriturity quite disappeared and perfectly live mothlity was obtained, the patient being able to bend each leg independently or to lift it high up (1 [g. 21]), and to abduct the legs walky [Fig. 22], the patient stands alone (Fig. 23), and he walks alone with long steps (Fig. 24); he bends the leg well in walking (Fig. 25) and steps well forward (Fig. 26), mounts stairs without fatigue, and is out alone in the open air for many hours

CAST 4. Severest spassic paralysis of all four limbs (ig 27). The patient was totally unable to carry out any voluntary movement; he lay in hed hoddled up (Fig 58), and in addition suffered from athetosis. Arms and legs were inextincibly inter-locked, as it were; in a tanglet. Root resection was carried out here both in the lumboostral and the cervical part of the cont. The Spassin were greatly experted to the cont. The Spassin were greatly experted to the cont. The Spassin were greatly experted to the control of the spassin were greatly experted to the state of the control of the spassin was also the spassin with the spassin was the spassin with the spassin was the spassin which was the spassin the spassin was the spassin which was the spassin was the spassin which was the spassing the

use his bands to eating and drinking.

Hevesy, too, has reported particularly
good results, and Goldenberg has demonstrated, at the last congress of German surgeons at Berlin, a case who be force the operation could hardly stand and scarcely move,
and one year afterward traveled alone from
Numberg to Berlin, to show himself to the
congress.

I next quote 3 cases of hydrocephalus with spartic paraplegia; 2 died and one was greatly benefited Hydrocephalus is a delicate condition for any operation upon the nervous system

Next we find 8 cases of spastic paraplegia as the consequence of infantile encephalitis, all more or less successful

I come now to the case, of spastic paralysis a spinal diseases. There were 4 of traumatic origin, 2 were successful, 2 not. One case of spastic parapilega was due to a tumor of the spinal cord, the tumor had previously been removed some time before the root resection. No paraticular result.

In one case of Potts' disease, stationary for a long time, good result

Six cases of syphilitic mychtis all were successful, although in one case the syphilis progressed later on, causing renewed paralysis. Among 11 cases of disseminated sclerosis, 4 died, 4 obtained a favorable result, and 3 no success. The sclerosis progressed rapidly after the operation

In 23 cases of spastic paralysis of the arm treated by resection of posterior cervical roots, 2 died; in the majority the result was not good, a satisfactory improvement being obtained in only a few cases, since the spasticity was not accompanied by any great paralysis. I refer to the case already demonstrated.

Besides, for real spasticity and spastic paralysis, the resection of posterior roots bas been recommended also for some other motor disturbances differing from the former; at first the athetosis. As early as 1905, Spiller bad suggested this, and during these last years it has been performed 13 times. The results were mostly bad, in a number the athetosis being even increased No wonder. for in athetosis the muscular spasms are not due to an increased afflux of sensory stimuli to the gray matter of the spinal cord, but to an increased afflux of motor impulses, proceeding from the middle brain and carried by motor paths to the anterior spinal horns. Resection of posterior roots in athetosis is justified only when a real spasticity, as the consequence of injury to the pyramidal tract, exists besides the athetosis, which is sometimes the case.

Finally, I mention that Leriche has divided some posterior cervical roots in a case of Parkinson's disease, with, as he says, a satisfactory result After this review of cases, I have to enumerate the single indications and contraindications for the resection of posterior roots in spastic paralysis. First, the morbid process must be stationary, or Therefore the maprogressing very slowly jority of cases of disseminated sclerosis must be excepted. Syphilitic affection of the brain or spinal cord ought to be operated only after an energetic specific treatment, and must be subject to such afterwards Under such circumstances the prognosis seems to be good. In spastic paralysis through tumor, the latter has to be previously removed, in Potts' disease, the bone process must be cured first.

Secondly, we must bear in mind that the resection of the posterior roots relieves only the spastic symptoms, but not the paralysis, if such exists besides the spastic state A certain residue of the innervating pyramidal fibres must be conserved, or else the spastic paralysis is transformed only into a flaccid one through the root resection. Failure in a great many cases is thus explained, especially in cases of spastic arm paralysis in hemiplegia. In spite of the removal of spasticity, many muscles necessary for the use of the hand remain paralyzed. On the other hand, in cases of complete spastic paralysis of the legs often a great number of innervating pyramidal fibers are conserved; but the voluntary excitability of the muscles cannot be demonstrated, being checked completely by the insurmountable spasms Root resection in such cases produces a striking voluntary mobility. How shall we recognize, in face of cases of complete spastic paraplegia, whether all innervating fibers are destroyed or not? Goldscheider bas suggested intradural injection of stovain, which puts the posterior roots for some time out of function; spasticity disappears, and now it remains to be seen whether movements are possible Generally, we may say that in cerebral spastic paraplegia more chance exists for a number of innervating fibers being conserved than in spinal spastic paraplegia.

Thirdly, after the root resection and the return of voluntary mobility, a long and very careful exercise treatment is necessary, by which alone locomotion is gradually gained. For this a certain degree of intelligence is indispensable. Cases with idiocy are unsuitable. Also, in cases in which the patient cannot stay in the hospital a time after the operation, for exterior reasons, or in which want of care for the exercises on the part of the parents is to be feared, operation would

better be omitted

I pass over the orthopedic treatment often necessary after the root resection.

Fourthly, the disappearance of the spasticity after the root resection, taking place with the certainty of experiment, is the best proof of the sensory origin of the spastic contracture. But a certain degree of spasms sometimes returns, owing to the fact that the spinal gray matter is gradually recharged by the remaining posterior roots. Especially the arm is subject to such a return of spasticity, another reason for arm paralysis not being very suitable for root resection. In every case it is absolutely necessary that as many roots as possible be resected. For severe spastie paraplegia I recommend resecting at least five roots. It is necessary to leave the fourth lumbar root, since this root generally guarantees the extensor reflex of the knee so very necessary for standing and walking. Thus the general rule is resection of the second, third and fifth lumbar and first and second sacral roots. Unfortunately, there exist individual differences; in some cases, the fourth lumbar does not affect knee extension but knee flexion, as the fifth lumbar and first sacral do: the knee extension is affected only by the second and third lumbar roots. In such cases, the above mentioned resection of the second and third lumbar, etc., is wrong; the third lumbar must be left, instead of which the fourth can be resected. In order to know by which lumbar roots the extensor reflex of the knee is effected, we must have recourse to the electric current during the operation. I use it now in all cases. Table IV shows the results of stimulation of the different roots in the generality of cases, but in a minority the results differ, as I bave already shown. The electric stimulation affords also the advantage of making a sure distinction between the anterior and the

posterior root possible, the former reacting to the current with a motor effect, the latter

TABLE IV

Effects of electric stimulation of the lumbar and sacral

II Sacral Plantar flexion of toes. Plantar flexion of foot. I Sacral Plantar flexion of foot Flexion of knee.

V Lumbar Flexion of knee Extension of hip.

IV Lumbar Dorsal flexion of foot Outside rotation of hip. Extension of kncc.

Flexion of knee III Lumbar Knee extension. Adduction of hip

II Lumbar Knee extension Adduction of hip. Flexion of hip.

I Lumbar Flexion of hip

For the arm, it is advisable to resect either all roots from the fourth cervical, to the second thoracic root, except the sixth cervical; or to resect from every single root, including the sixth cervical, the majority of the fascicules composing each root.

DISCUSSION BY DR. ALBERT BAUER, BRESLAU, GERMANY

SHOULD like to speak a few words on the surgical technique which in the resection of roots has been constantly followed at Professor Kuttner's clinic in Breslau. Kuttner has performed this operation in 30 cases altogether, once for pain in a case of syphilitic radicultis, already mentioned by Prof. Foerster; 7 cases for gastrie crises. One of them died, during the operation he was attacked by a respiratory paralvsis, and had to be put on his back, the dura was opened in order to produce artificial respiration. He died of meningitis. Kuttner has operated 31 cases for the relief of spasticity, 2 of these, both children, died in an epileptic attack after the first stage of the operation. Therefore Kuttner now excludes epideptic cases from the radicotomy, The 3 deaths among the 30 cases make a mortality of only

7½ per cent Kuttner champions the performing of the operation in two stages. He is convinced that tabetic patients, suffering from gastric crises, are all more or less weakened by the disease and the great doses of morphia they take, and would not resist the long operation at once, it producing a considerable shock to the whole nervous system and acting intensely upon the heart and respiration The case of gastric crisis which he lost was operated in one stage; the respiratory paralysis took place only toward the end of the root resection Had it heen done in two stages, all would have gone well.

Kuttner also operated spastic paralysis in two stages. The majority of the patients, particularly adults, have less power of resistance. Added to this, for recognizing and isolating the right roots the field of operation must be free of blood, which is scarcely the case in freshly opened vertebral arches, though it is indeed some days later. The danger of infection to be risked by performing in two stages is imaginary. Not a single case has lad an infection. Kuttner performs the laminectomy always with simple Luer tongs; he resects definitely, not temporarily, the vertebral arches. He proceeds according to the original method, picking up and resecting the roots, at the point where they perforate the dura.

It has been recommended by several

authors to resect the roots on the point where they issue from the lumbar enlargement of the spinal cord, as at this point they lie much closer together and therefore demand a far less extensive laminectomy.

We reject this proceeding, as it renders it impossible to distinguish the different roots. The few cases thus operated are not very promising.

Last of all, your attention is called to five cases in which he has performed the root resection both in the cervical as well as in the lumbosacral region. All these patients were suffering from spastic diplegia.

THE SURGERY OF SPINAL CORD TUMORS FROM A NEUROLOGIC VIEWPOINT:

BY DORSAY HECHT, M. D., CHICAGO.

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and Westey Hospitals.

THERE is much warrant for the belief that individualistic effort, however competent, is seldom equal to the tasks imposed upon it in the solution of many of the recent clinical problems in the field of neurology

Surely the need for and the desirability of a joint kind of study and service on the part of the neurologist and surgeon have been abundantly testified to in the last quarter century, that is, since: 1857, when the successfully operated and completely recovered Inrsley-Gowers case was consigned to its place of first and historic importance in the surgery of spinal cord tumost.

The excellence of much of this co-operative work done, let us say, in the past two decades has had a twofold effect—the development of greater diagnostic acumen in the neurologist and the occasional conversion of a general surgeon into a neurosurgical specialist whose neurologic attainment inspires quite as much confidence as does his surgical skill and is held in the same high regard.

The time and energy, however, devoted to the surgery of the skull and brain have hitherto been immensely disproportionate to that expended in behalf of the spine and cord, probably because of the much more frequent occurrence of cerebral tumor.

This uneven division of labor is unfortunate and its continuance to be deprecated, since the guiding and determining factor in any form of therapeutic intervention should be not so much the frequency-incidence of a lesion, but the prospect of relief or promise of recov-

ery—in short, the prognosis.

A review of the literature tends to show that the cord is at no disadvantage when compared with the brain as the object of surgical attack. In fact, both decompressive and radical measures applied to the spinal cord and its dural and bony envelope, when in entirely competent hands, are attended with more gratifying results than may be claimed for the same surgical procedures applicable to the brain under identically favorable conditions.

Statistics variously compiled in the past twenty years seem to indicate that one half of all intraspinal tumors are operable, and of these, one half are much benefited and not

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autopsy notes point to brain involvement, the theory of an internal bydrocephalus has been advanced, caused by an occlusion of the spinal subdural space at the site of the tumor. Heubner reports the occurrence in a child of seven of an internal hydrocephalus comblicatine a clioma of the cord.

Cidema of the lower extremities, as a vasomotor phenomenon occurring chiefly in the lumbosacral and caudal tumors, has been observed by Bailey (10), in whose case it resembled the swelling due to renal disease, but the urine was normal.

3. One cannot read the papers of Spiller (11), Horsley (12), Krause (13), Oppenheim (14), Weisenburg (15), Mills (16) and Munro (17) on circumserbled spinal meningitis without feeling that many hitherto imperfectly understood chronic cord conditions are now made more intelligible to the clinician, more easily grouped, and therefore more promising in the surgical sense. The chiel clinical attribute of this newly recognized entity is its close ministry of cord tumor, and in this connection, without going into pathological detail, It desire to emphasize its importance. According to some writers it is rare, and yet it is certainly not so rare

as not to be, in the opinion of Horsley at least,

more common even than tumor. The largest clinical contribution to the subject of circumscribed meningitis is that of Horsley (12), who from his series of 21 cases has drawn conclusions that ultimately may make the line of differentiation between intradural tumors and subdural cyst accumulation more sharp than it now is. The causal factors are not clear, and the diagnosis would, in the main, seem to depend upon a slower onset and a greater diffuseness of all the symptoms and signs of the disease Horsley, for instance, emphasizes that tumor pain is more restricted to the distribution of a single root, whereas in this form of meningitis it is more diffuse, involving an entire extremitythat the weakness and wasting also tend to be widespread and embrace a whole limb He holds that the same is true of disturbed sensation, which is more likely to affect an entire extremity and show hyperasthesia in contrast to which tumor more often presents

varying degrees of anasthesia. Although Horsley attaches much weight to this diffuse hypersensibility and the absence of focal anasthesia in all of his cases, Weisenburg (15), in his strictly circumscribed cyst, calls attention to the levels of sharply defined anæsthesia for touch, pain and temperature and their almost daily vacillation. This case more than others seems to justify the contention that a true cyst formation may exist and as such is to be differentiated at least pathologically from the Horsley type. The vasomotor symptoms occasionally found in tumor, Horsley has never observed in chronic meningitis, whereas in the Weisenburg case, the right thich was swollen and the skin of the inner parts of both large toes was tinged a bluish red Contrasting observations such as these may or may not at the present time clarify the clinical picture, but they certainly show a determination to arrive, if possible, at a preoperative diagnosis of circumscribed serous meningitis. I am not prepared to say that intrinsically there is any difference between the Spiller-Weisenburg conception of an idiopathic collection of clear fluid in a cyst of the spinal pia-arachnoid and the Horsley view of a chronic spinal meningitis I am, however, disposed to believe that in either condition, a decompressive laminectomy is indicated, that the release of fluid under tension should promptly relieve the symptoms, and if we may believe the statistics, will result in an ever increasing percentage of partial and even complete permanent

4. A critical survey of Stursberg's (1) many citations in tabulated form makes it plain that surgical flaws have been quite as common as neurologic flukes in the cord tumor problem. It is not pertinent to the caption of this paper to discuss these. Only in so far as they affect the prognosis are the nature and extent of the surgical procedures of interest to the neurologist. The timeworn contentions held in regard to the employment of large versus small incisoons in general surgery obtrude themselves in this special field, and we find one operator advocating the resection of many spinous processes and the making of a large operating into the canal, while another

SUMMARY OF THE RESULTS OF OPERATIVE TREATMENT IN HITHERTO REPORTED CASES, STURSBERG'S (1) TABULATION

	latra and extra-dural merblasms except these starting from the lour or passing over it							Nonflarms starting from the bone or pairing							Total of observations						
	Favorably influenced	Permanently cured or consulerably improved	Soon after operation or from its effects	Independent of Contract of Operations	Not safuenced	Uncertain sector	Total of others stems	Saverably infursced	Permanently curre or considerably improved	Some after operation of it on its effects	Independent of operation	Net influenced	Lucertain notes	Total of observations	Favorably influenced	Permanently cured or considerately amproved	Scon after operation or from its effects	Independent of A	Not influenced	Locertain notes	Total of observation
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Dorsal purtion of spinal cont	40 17	47 37	, 16,	٠	5 3	ľ	57	1, 10	n's	13 17	3			117	50 07	4, 6,	18	11	3.7	1	65
Lumber portion of spinal cond	11,10	,6 6~	14 17	3	-	-	12	45 77	14 15,	Γ		11.50	Γ	1	03 05,	10 07	16 ori	3	400		23
Location not us.		Γ			_									-			·				
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favors hemilaminectomy, with a saving of spines and a smaller entrance to the canal Here, as in all surgical work, the end justines the means, and if it requires a large exposure to gain easy access to the field of operation. it seems to me unwise to limit it especially when the sub-equent protection to the cord is not seriously impaired. Again, the larger opening seems desirable when one realizes what great retinement in technique is essential to success. I am not sure that palpation through an intact dura is reliable in determining the presence of the tumor Cases are recorded where it has eluded the feel of the palpating finger. With the exposure of the cord proper and the confirmation of the diagnosis, the active participation of the neurologist in the surgical aspect of the tumor problem is likely to cease, for after all questions of technique, mortality from hæmorrhage, loss of cerebrospinal fluid and infection rest more largely with the surgeon It seems to me that the high point in neutologic responsibility is reached when the diagnosis is established and the indications are drawn for the proper kind of surgical intervention.

It is my personal belief that the ultimate results in both the decompressive and radical surgery of the spinal cord warrant the neurologist and surgeon in taking all the risks, particularly since fatality is incvitable in tumors where operation is either too long deferred or altogether discouraged and denied.

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 MENRO Surg, Gynec & Obd., 1910, 235.

a few entirely cured. Easily the best, most comprehensive and complete tabulation of spinal cord tumors and their operative treatment is that of Sturberg (1), who cites 126 cases, together with some 85 references. From this compilation we are permitted to infer that good recoveries are made in more than 30 per cent of cord tumor operations. Excellent as is this percentage, it no doubt can and will be improved upon when diagnostic error and therapeutic temporizing, on the one hand, and poor surgical judgment with faulty technique on the other, are reduced to a minimum.

The inquiry into spinal cord disease must be made to transcend issues of mere physiology and pathology and embrace the clinically more absorbing problems of injury and repair inevitably associated either with

If for the sake of the best achievement a

trauma or tumor

conjoint effort is desirable, then at seems to me that the neurologic opportunity lies first of all in the direction of greater accuracy in the diagnosis. (1) the more exact differentiation from chronic spinal cord diseases; (2) a kecner analysis of the less common, atypic symptoms, (3) a better understanding of the rôle of circumscribed serous meningitis and intraspinal cyst formations, and finally (4) the endorsement of early suggical intervention, in the sense of both the decompressive and radical operations

To discuss in their turn some (by no means all) of these clinical phases in relation to spinal tumor, may not be altogether un-

profitable

x 1 believe that the differential diagnosis between cord tumor and certain chronic spinal diseases, however refined, will always present some difficulties until more defante, let us say, cy tologic criteria, come to have greater ctin ical significance. To this end, Kleineberger (2), in four cases of extramedulary cord tumor, analyzed the fluid taken by puncture at a point well below the tumor. This he found to be a deep yellow (xantluchronim) capable of very rapid coagulation and showing an increased cell count. Similar findings had previously been reported by Cestan and Ravaut (3). Reichmann also reports the cere-

brospinal fluid from an intramedullary tumor as being a pronounced yellow and possessed of rapid coagulating power. It is to be hoped that more ample confirmation from the cytologic side will be forthcomine.

I cannot subscribe to the view (4) that "the diagnosis of spinal tumor presents no difficulty and should be made very early; in fact, as soon as spinal symptoms are associated with intense persistent pain in one locality." If it were all so simple, there would seem to be little need of further development of the problem. In fact, any bony thickening of the vertebral bodies may so encroach upon the lumen of the canal as to cause compression on the cord. Instances in point have been reported by Bailey and Casamajor (5), who have shown how a spinal osteo-arthritis was capable of causing localized paralysis as a compression symptom, with complete relief afforded by laminectomy This case, the writers tell us, "recalled a previous case in which the diagnosis of an extramedulary . tumor had been made, in which the operation, followed though it was by relief of all symptoms, showed nothing but a bony thickening of the lamina."

In practically every case of paraplegia in which the causal relation to the onset of paralysis is vague or wholly obscure, the query as to the possible existence of cord tumor is justifiably raised. A case seen only recently and regarded by some clinicians with suspicion as tumor has proven to be disseminated selerosis. Again, one learns that tumor may exist in the guse of multiple seleross, or that it may bear the closest clinical resemblance to sprinal syphilic selerosis or springomyelia, particularly to the latter, if it happens to be of intramedullary origins.

2 Errors in diagnosis, however, quite as unavoidable as they are costly, are made chiefly in the early stage of tumor grank, when the clinical picture is but slightly educloped, when symptoms are not true to type and run a rather unusual course. I refer more particularly to the root pains, localized paralyses, the sensory disturbances and certam accessory vasomotor or trophic manifestations.

As concerns the pain element in cord tumor,

it is of a character which we have learned to associate with the spinal roots-severe, radiating, burning, cutting, fulgurant. those cases where the meninges and intervertebral foraminal exits are extensively implicated, as in metastatic carcinoma. I believe they reach their maximum intensity and are aconizing beyond endurance. It is a mistake to think of these pains always as constant; whether unflateral or bilateral. they may fluctuate considerably from day to day or week to week, and even wholly disappear for longer periods of time respect, they may be likened to the simple neuralgias. It is not an uncommon experience for the neurologist to observe a "sciatica," so-called, appearing first on one side and later affecting both, existing on and off for months or even a year or more, as the forerunner of a syndrome that precheates tumor Clearly deceptive and therefore, worthy of record are the occasional instances where pain is conspicuous by its absence Schultze (6). in 1907, reported two cases of absence of pain or even pressure tenderness over the vertebras. In the one, a tumor about the size of a hazelnut was situated laterally on the cord, and in the other, a growth about 15 cm in length grew from the right side. These cases alone suggest that persistent absence of pain should not necessarily prove a contraindication to laminectomy if other symptoms appear consistent with such a procedure A small growth situated on the anterior aspect of the cord is the ready explanation for this anomaly In one case of my own (to be published later) a diagnosis of cord tumor was too long deferred and the opporuntity for relief wasted because the pain lacked the severity seemingly essential to a positive diagnosis The objective sensory disturbances that are

known to have a definite localizing value in tumor diagnosis are segmentary in type. But here, again, in a certain percentage of cases, the clinical behavior is contrary to expectation and anæsthetic areas will often show great irregularity and indistinctness in output. It is worthy of emphasis that the line of demarcation in the upper level of anæsthesia is never as definite as we observe it in traumatic compression, myelitis, or in transverse myelitis of infectious origin. Experience has frequently shown that spinal tumors found at operation or necropsy lie considerably higher than the segmental sensory disturbances would indicate. The surgeon, therefore, may safely accept the dictum to go one or even two segment levels higher in exposing the field of operation and a like margin may be observed in establishing the lower point of exposure Sensation may be affected in all its modes and tenses, but, on the whole, tactile sensibility is more disturbed than that for pain or temperature. Not infrequently, a typical syringomyelic sensory dissociation syndrome is present, and when this is the case it should not necessarily be construct as evidence of a centrally situated intramedullary growth I recently observed this particular type of dissociation in a case of vertebral tubercular disease with marked cord compression In this connection, the case of Boxaird and Schlapp (7) is particularly instructive Therefore, I am inclined to Bailey's (8) view that sensory dissociation in the elinical picture need not offer a contraindication to operation

I think we have a right to expect that some disturbance of sensation, most commonly of the tactile variety, will be present in all tumor cases. I should even say must be present, because, so far as I know (Bailey has also surveyed the literature on this point), it is not recorded that a positive diagnosis of spinal tumor has ever been made in the complete absence of objective sensory disturbance. The anasthesia need not be complete—the dightest reduction has at times the greatest significance, but its detection requires, as I have had cause to learn, the most careful, painstaking examination.

As it to add to the difficulties of diagnosis, a few new and most extraordinary symptoms have from time to time found their way into the literature. They have occurred sufficiently often to seem more than a mere coincidence. For instance, Taylor and Collier (g) reported the presence of optic neuritis in twelve cases of lesions of, the spinal cord, three of whichwere tumors of the cervical region. In such tumors, together with others of cervical origin, in which clinical and

THE FIELD OF USEFULNESS OF THE CLINICAL CONGRESS OF SURGEONS OF NORTH AMERICA 1

ADDRESS OF THE RETIRING PRESUDENT

BY A J OCHSNER, M D. CHICAGO

TOU have done me the great honor of electing me to the office of first Presi dent of your Congress, and I assure you that words fail to express my appreciation of this honor New York. with its wonderful clinics and its famous clinical teachers, offers a fitting field for the labors of this Congress No other city in the world has better teachers of clinical surgery than the present generation of surgeons in this city, and, judging from the preparations which have been made during the past twelve months, I am confident that we will have an immensely profitable week of clinical instruction, which cannot fail to result in human progress of high quality and lasting efficiency.

The keynote of all inspired activity of to day is contained in the idea of service All other conditions must retreat before this central, all-absorbing idea. The time when financial success, wealth or pomp, or distinction for valor in combat were foremost in the human mind is rapidly disappearing

as past history Personal achievement that does not contain the element of service must soon be classed as undeserving of general admiration. Half a century ago a few great teachers and philosophers grasped this idea in its full meaning and impressed it upon their pupils one of these has in a measure absorbed the spirit of the teaching that in order to be worth while education in all fields must in clude ethical development to a marked degree, and that education in the practical branches must mean not only the acquisition of the ability to do work successfully, but also the willingness to render service which is much more profitable to those who receive it than to him who gives it. This service benefits not only the individual, hut to a much greater degree also the community.

This Congress is in the broadest sense an educational institution. If it simply served to enable those of us who have the good judgment to attend its meetings to improve our personal condition, I would look upon it as a dire failure. If, on the contrary, it serves to improve the quality of the service our profession gives to the people of this country, then we may look upon it as a successful institution and a worthy element in the progress of American civilization.

The first elements necessary to improve both the quantity and the quality of service are inspiration and enthusiasm. The meetings of this Congress have given inspiration which has lasted throughout the year with

many of the participants

Many important facts resulting from the enormous experience of the ablest clinicians of this and other countries have been carried

by our members to all parts of this country. In every large city there are famous dinics which can easily be found, but there are also among the younger workers who are relatively unknown those who are doing admirable work which is well worth the attention of the surgical profession. These men can demonstrate their work during the sessions of this Congress, and can establish their ability as clinical teachers and scientific workers and be judged by compari-on Thus the Congress serves as a trainingschool for teachers of chnical surgery, and will furnish an opportunity for natural selection by the survival of the fittest. Thus every clinical teacher has equal opportunities with all others to demonstrate his qualifications and his caliber From the educational standpoint we have gained much. The Congress has already demonstrated the presence of most excellent clinics in many hospitals which had previously not been known to the surgeons of this country who are seeking clinical knowledge and

a Read before the Third Chascal Congress of Surgeous of North America. New York City, November 11, 1012

481

thus has increased greatly the efficiency ol our resources for surgical education.

In each of the three cities visited by this Congress the surgeons have become more thoroughly organized for efficient teaching, and they have learned in this way to appreciate more fully each other's work is certain to eliminate provincialism and stimulate progress by mutual comparison

To the practitioners of surgery it has given an opportunity to see the great surgeons of the country at work, which enables them to read the writings of these men with greater interest and profit. I dare say there is not a member present who will not increase the amount of his scientific reading because of his personal observation of the work done by the writers.

After all, the efficient surgeons of to-day, namely the surgeons who are best equipped for service in the broadest sense of the word, have acquired the most important part of their equipment after graduation from

medical school

It is not the man who had the best education before receiving his doctor's degree who is the greatest surgeon in wisdom, in learning, in efficiency, in practice, and in equipment to give human service. If we should select the ten men in this country who rank highest in the field of surgery measured by the above standards, not more than three or four would be men with university degrees before entering their medical colleges

If we compare these men, who might be considered deficient from the educational standpoint, with an equal number of the greatest surgeons from all other parts of the world, they will stand out with distinction by such a comparison

It is the man who has been inspired to work, and who constantly finds means for unfailing enthusiasm, and who continues his studies and frequently observes the clinical work of others, who ultimately becomes the most efficient surgeon and the man of greatest learning. These facts will not apply to the next generation of surgeons in this country, because better opportunities will be provided for undergraduate classes, but they obtain for our generation.

The Clinical Congress of Surgeons of North America is demonstrating its ability to organize the present surgical profession of this country into a body that will make for the development of the greatest possible efficiency in this field for human

service

While doing this it provides inspiration and educational opportunity which affects in a most advantageous way all members of our prolession who are working for improvement. The organization contains to a high degree the means of advancing this exalted principle ol service, and deserves to the fullest extent the splendid support it has received from so large a number of the strongest men in our profession

EXPERIMENTAL LIGATION OF THE PORTAL VEIN; ITS APPLICA-TION TO THE TREATMENT OF SUPPURATIVE PYLEPHLEBITIST

BY HAROLD NEUHOF, M. D., NEW YORK CITY

From the Fathological Laboratory of Professor Ludwig Pick Arankenhaus Friedrichshein Berlin

THE fact that no surgery of the portal vein has as yet developed appears to depend upon the results of animal experimental studies. Many observers have demonstrated that ligation of the portal vein regularly leads to death in a very short time - in half an hour to two hours. Their work will be discussed subsequently; it suffices to state here that the human portal vein has been considered a noti me tangere as a result. Although the portal vein has been more or less completely ligated for accidental injury in a very few instances,2 a deliberately planned ligation of the vein has never been practiced.

e Brewer Ann Surg. Phila., 1903 niva, Hallopeau Rev d Char.

Read before the February meeting of the Sutgread Section of the New York Academy of Medicine

Were there no practical indication at present for a knowledge of the results of portal vein ligation, such information would be desirable for possible future application. I helieve, however, that, of the diseases involving the portal vein, suppurative pylephleibitis is a condition requiring a knowledge of the results of portal vein ligation at the present time. With this in view, the literature on the subject of portal vein thrombosis and occlusion was examined and some experimental studies were made

In 1856 Oré1 demonstrated that ligation of the portal vein of rabbits resulted in death in a very short time. Schiff.1 Claude Bernard.3 and others determined that, following this procedure, dogs invariably die within three hours. The symptoms described as the result of portal vein ligation were progressive weakness, paresis of the posterior extremities, an inconstant lowering of temperature, accelerated respiration, coma, and death. Bernard believed that death was due to acute anæmia. the result of accumulation of blood in the portal vein and its tributaries It was demonstrated by Tappeiner, however, that more blood could be withdrawn from a dog without causing death than that accumulated in the portal district after the vein was ligated Another hypothesis was that death resulted from suppression of the function of the liver (Schiff and others) It was subsequently found, however, that the blood from the heart proved no more toxic after portal vein ligation Furthermore, prolonged life is possible after an Eck fistula has been established. Without entering into all the theories that have been advanced to explain the cause of death after ligation of the portal vem, it may be stated that none has received general acceptance 5 To determine if animals could live after any

form of portal vein occlusion, it appeared desirable to attempt to ascertain the cause of death after complete ligation. In several successive experiments (five in number) the portal vein was completely tied off. The following experiment is a typical one, and the satisfactory technique that was developed for the exposure of the portal vein of the dog will therein be described.¹⁹

JEspensent J September 13, 1012, 4 P. M Large, powerful female day. No preliminary does of morphism Elder ansentiesis. Curical mission starting many partial properties of the properties. The properties of the protal view level elevated, and the pylonic end of the stomach drawn downwards. The region of the portal view the properties of
splenic vein Vern tightly ligated Operation completed at 4 25 P M Observations at end of operation. Animal evidently in poor condition. No signs of recovery from anasthetic (although reaction bad begun before the vein was ligated and very little anasthesia was given thereafter) Pulse slow and very compressible Respirations rapid (32 per minute), shallow, slightly irregular Pupils do not react, although corneal reflexes are present 4 40 P M, animal remains unconscious. Abdomen markedly distended, tympamiic. Respirations as before, no air-hunger, however Pulse generally as before, occasionally erregular and rapid Skin cool and slightly moist Musculature completely relaxed Death at 4 55 > M , ushered in by slight, generalized convulsions Although pupils did not react, corneal reflexes remained until the end

Fort-morten Enal amount of bloody full of inperitoneal cavity. Stomach moderately datended Small intesames greatly distended and deeply quantum, the mescatery very edematous. Some blood in intestinal lumen. Intestinal wall very edematous and firm to touth, many larger and smaller scattered submurous betweenthages in small infections of the control of the control of the many larger and state of the control of the control services. The control of the control of the control of the services are control of the control of the control of the meaning organs somewhat anximic, otherwise negative.

The manifestations were approximately the same in all the experiments in which the portal vein was completely ligated Death invariably occurs in from fifty minutes to an hour and a half after ligation, in a surprisingly

Ore Compt-rend hebdom des Sétners de l'Acad d. Sciences un.

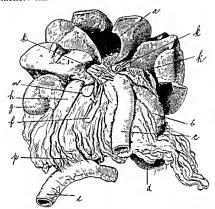
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² Claude Bernard Legons sur le diabète et la Glycogenère Animale Paris 1877

^{*}Tappener, Ueber den Zustand des Blutstreens nach Laterhandung der Ffortader Arb e d. physiol Annt zu Leipzig 1872 *Norder all the studies in portal vein ligation were made finen therty

^{*}Neady all the studies in portal vira ligation were made from thirty to sarty years ago. It is therefore not surprising that some theories thin advanced to explain death now prove untenable. Modern notions concerning shock, for example were not evolved until recent years.

^{*}The literature contains no description of the technique and but scant information concerning post-morton findings after portal vent feature.



Drawing to show the collateral circulation after beauton of the portal vein (Experiment) (a) Cavity left in here by removal of the gall bladder (b) Stomath (c) Docestima (b) Spleen (b) Green Latauren of the collateral collateral control of the collateral collateral control of the collateral collateral continuing numerous collateral veies (m) Brandon of vena cava accompanying the hepatic artery to hver (c) Small area of anastomous between portal branches of lower lean and branches of vena cava

uniform manner Respiration becomes superficial and accelerated (up to forty-five a minute). Considerable abdominal distention develops The pulse is generally slow and In those animals recovering compressible consciousness pronounced weakness of the lower extremities is evident. Death is ushered in by generalized convulsions Although the pupillary reaction does not usually return after the vein has been ligated, the corneal reflex remains active until a short time before death Usually the animals do not recover from the anæsthetic (two of the dogs reacted from the ether for very brief periods), but sink into a comatose state from which they cannot be aroused. Post-mortem examination reveals moderate distention of the stomach and enormous distention of the small intestines The latter are deeply cyanotic, the intestinal wall is intensely cedematous and firm and shows numerous larger and smaller submucous hermorrhages. The lumen contains some blood. The spleen is enlarged to two or three times the normal. It is very firm, its capsule tense, and there are extensive subcapsular haemorrhages The remaining viscera are somewhat anæmic but not blanched

The clinical manifestations, the manner and time of death, and the post-mortem findings indicate that death following complete ligation of the portal vein is not due to acute anemia or to intoxication. On the other hand, the intense acute engorgement of the

Jintestinal tract and the extreme intestinal distention have been found to be the cause of death both in the human being and in animal experimentation carried out for various purposes. Without retracing the steps whereby the present view has been reached, one may state that it is now generally held that death in such instances is due to shock. Analogously, therefore, death from complete ligation of the portal vein is also due to shock.

When death was found to follow so promptly upon portal vein ligation, the question that arose was whether ligations at different levels would also prove fatal. In 1900 Kusnetzow! reported that ligation of the portal vin below the entrance of the gastrosphenic is fatal, but that dogs may live if the portal is occluded above the gastrosphenic vein. His work has not been confirmed by subsequent experiments, including those of Ito and Omi's and of mine. The following example illustrates the results I have obtained:

Experiment 6 September 17, 1912, 4 30 F M Good-stated lively mongrel Prehimary dose of morphine Ether anaestheas 17 Personady described incision and exposure of portal year. Simple described incision and exposure of portal year Simple described into the portal Latter (gasted) can below the point of entiance 5 M is operation concluded and wen has been occluded for ten merconservations of the past of the past of the post of

The post mortem findings correspond with those above described

It was first demonstrated by Solowieff a that dogs could survive occlusion of the portal vein if the branches were ligated at different times. He ligated the superior mesenteric ein at the first operation, the gastrosplenic cein a few days later, and finally the portal vein above the gastrosplenic Some of the animals lived weeks and even months after operation. Two subsequent observers did not confirm Solowieff's results in the single experi-

Ite and Dan, loc. est.

ment that they report. As the result of their work they conclude that dogs may live if the branches of the portal vein are ligated at different operations. If, then, the potal vein is ligated above the gastrospienic, death results, but less promptly than when preliminary ligation of the branches has not been practiced. I repeated Solowieff's experiments with modified technique and could confirm his results, as demonstrated in the following

Experiment 8 September 24, 1912 Brown and white dog, weight 83.20 gm. Ether anasthesia, with preliminary dose of morphin. Low vertical incision immediately to right of median line. The inferior measurement were readily found and lighted dose to the portal trunk. Careful suture of abdominal wall Animal recovered promptly and was outle well next.

day Weight remained unchanged

September 58, ancromments before Right-sided and consistent with the second before up the superior meanterin thigated about 4 cm from the portal. The small intertune thereupon became somewhat cyanolic, the venns engoged. No further charge being noticed after ten manuter observation, the abdomen was closed. Return of conceptuates after operation of the control of t

October 7, ether narrous Curved notion for exposure of portal vitin as described in Exp 3 Spleme vein (tena gastrolinealis) exposed not entrance, into the portal and there ligated. Spleen at once became cyanotic and enlarged. A ligature (fall) was placed about the portal vein above the gastrosplenie as a guide for the subsequent operation. Source of abdominal sail in layers. The dog recovered promptly from narrous Except for supportation of the abdominal the best of the control of the abdominal the post of the abdominal to the abdominal the abdominal the abdominal the abdominal that the abdominal the abdominal that the

October it, ucroson just median to previous one Sighi localized pentionits found about portal veia, with small quantity of turbud fluid but no pus Legature about portal freed from adherent omentum and need Abdominal incoson closed about a superficial dram. Evolutionally and about a superficial dram. Evolutionally well, seemed quilte normal wait itse thard day after operation, then became gapithetic, took little food and began to

¹ Kusnetzow, Rousek \ratch, tooo Nos. 32 and 35 (abstracted by Gockel in Zentralbi 1 Chir., toos No. 4) 2 Ito and Oms, Doutsche Zischr 1 Chir. 2001-2, No. 6s

¹ Solomieff, Virchows Archiv, 1875, bill

lose weight. Evidently a low grade of pentonitis Animal sacrificed the sixth day after operation

Post-mortem: Pus in abdominal wall Abscesses in omentum Portal vein completely occluded 2 cm above the entrance of the gastrosplenic vein Localized peritonitis about the vein The branches of the portal found ligated as described in experi ment. Spleen somewhat enlarged and firm In testinal wall somewhat engorged, shows remains of several old submucous hæmorrhages A collateral circulation had evidently already begun to develop The gastrohepatic omentum (ordinarily very thin and bloodless) is thickened and rascular, numerous fine vessels coursing in it from the region of the stomach to that of the attachment to the liver Several anasto motic arches between branches of the portal vein and the inferior yeng cava. The liver itself quite normal

Without entering at this point into the details of the development of a collateral circulation (such as that described in the previous experiment), it is evident that the results of portal vein ligation hinge largely upon such development. It was therefore natural that the attempt should have been made to experimentally establish collaterals by means of omentopexy and then to ligate the portal vcin at a subsequent operation. In fact, occasional successes by this procedure have becn reported (Tilmann, Bozzi, Kusnctzow 3) In the preantiseptic era both Oré and Bernard found that extensive peritoneal adhesions (the result of infection at the time of operation) carried the collateral circulation and that the portal vein could, as a result, be successfully occluded The establishment of collateral circulation by such methods is not susceptible of practical application to the human being I therefore determined to attempt complete ligation of the portal vein by several operations directed at the vein itself. to ascertain if dogs would live under such circumstances, and if a definite type of collateral circulation would regularly develop.

The plan was to moderately narrow the 'lumen of the portal vein at the first operation, at the second operation, several days later, to place a ligature that would further encroach upon the lumen, finally, to completely ligate the vein, at either the third or the fourth operation, depending upon the behavior of the intestine when the vein was provisionally

clamped off.4 This general plan was successfully carried out in several instances. A single example will suffice for the description of the details.

Experiment to Tan-colored dog, lemale, weight 8310 gm. Ether narcosis with preliminary morphin in all the operations

September 26, 1912, usual curved incision for exposure of portal vein. By dividing the layer of perstoneum in front of it, the portal vein was isolated almost its full extent above the gastrosplenic en-Was then surrounded by a silk hgature passed through one cut edge of peritoneum in order to fix it The ligature gently drawn upon until the lumen of the vein remained one half the original Ends of ligature left fairly long for future gaide No evidence of disturbed intestinal circulation Peritoneum carefully sutured, according to a method described by Neuhoff and Wiener 1 to avoid omental adhesions Animal recovered promptly from operation, quite normal next day Appetite good Slight loss in weight

September 30, incision to right of previous one Abdominal wall more vascular than before Omentum not adherent Ligature around portal vein lound to have (about) half occluded it. The ends of the heature caught in a forceps and twisted until the vein was about three fourths occluded phenomena observed in the intestines the ligature. therefore, permanently fixed in its twisted position by a second ligature tied around it and stitched to the adjoining peritoneum. Careful layer suture of abdominal wall. After operation, slight abdominal distention but no appreciable change in pulse or respiration Rather slow recovery

October 1, slight spasticity and "steppage" gait ol hind legs Retention of urine over night Takes little nourishment

October 2. general condition better Manifestations in posterior extremities gone except for somewhat increased reflexes Stool normal Weight, 7850 gms

October 4, condition practically normal suppuration in the wound October 6, vertical incision median to original

one Ligature about portal vein lound with some difficulty Vem temporarily clamped to see if phenomena in intestines occurred. No change in ten minutes Portal vein accordingly completely ligated near its entrance into liver Layer suture of abdominal wall Prompt recovery from anæsthesia October 7, dog in normal condition

¹ Tilmann, Deutsche med Wehnschr. 1800, No. 18. Quoted by Schizzzi in the Semaine med , Par , agor, No 19 Loc cit

The the personner was done as employed. In an earlier part of the paper the charges of constant of the paper the charges of constant or constant of the charges of the char

[&]quot;Neuhof and Wiener Surg Cymee & Obst., April, 1910

October 15, after moderate loss in weight (down to 7100 gms), return to practically normal General condition excellent

November 1, nothing abnormal noted to date Animal sacrificed

Fest monten: Congested tongue of omentuam adherant to anterior abdominal wall A few vascular adhesions between coils of intestines. Inconspictious anastomoses between hepatic and disphragmatic vessels and the gastine and esophaged vens. Anastomoses between some branches of the portal system and branches of the vens cava accompanies the hepatic Abranch of the vens cava accompanies the hepatic mail. No diditation of the karmorholds or penumbilistic vens.

The grastohepatic omentum, normally thin and transparent, is strikingly vascular. Numerous vessels awend in it from the region of the stomach, duodenum, and panereas and enter the liver over the collapsed branches of the portal vein. Some of these vessels, however, do not enter the histo of the hier but pass directly into it at various points.

The portal ven is completely obherated by the liquitur 2 cm below its upper end, the liquitur is deeply embedded in the wall of the vessel. The inter prethpa sightly firmer than usual. Otherasse norm it in size, slape, and color. Spiken firm and megative. No emporgement of the vessels of the portal distinct. Remaining vincera negative. Spinal cond negative.

There was not sufficient time for microscopical examinations to be maile in Prof Pick's laboratory and they were done by Dr L Moschcowitz of New York at Prof Pick's request I am indebted to Dr

Mosthcowitz for the following report
"Lamination of the sections of the liver does not
reveal anything particularly abnormal. The only
chinge is a light dilatation of the capillaries. The
cells stain well and the capsules of Classon show
nothing. Perhaps there is also dilatation of the
portal vens branches in the Clisson capsules but the
increase in air. can only be considered as very
moderate. The section from the gastrolepoils'
control abnormal propriates. The branches of
the berystic artery seen on the sections do not show
the slightest endirection." (See illustration)

It has therefore been established that complete occlusion of the main trunk of the portal vein is experimentally feasible provided such occlusion be gradually induced during a period of several days. An efficient collateral circulation develops, chiefly in the gastrobepatic mentum 1

What analogy exists between the exem mental and the clinical findings? Since its: when Gintrac 2 collected six cases of occlusion of the portal vein in the human being a on siderable number of such instances have been reported. Some of the patients have lived many years with complete steno-is of the portal vein. The resultant anastomotic orculation was considered analogous with that developing in cirrhosis of the liver (enlargement of the resophageal, rectal, paraumbihed veins, etc., so generally known through the writings of Frerichs and others). Recently, however, Charpy 4 discovered an additional series of vessels in the lesser omentum that play an important part in the anastomotic circulation Pick,5 in 1909, was the first to clearly indicate the significance of these veins in the lesser omentum. He reported a case in which the portal vein had been occluded for many years (by a eavernoma of the vestel wall) and demonstrated that the portal blood was carried to the liver chiefly by these veins in the gastroliepatic omentum. Furthermore, Pick pointed out that, in hepatie cirrhosis, a useful anastomotic circulation is one carrying the blood away from the bier ("hepatofugal"), in obliteration of the portal vem, on the other hand, a useful circulation would be a "hepatopetal" one. The latter, via the gastrohepatie veins, is clearly demonstrated in his case. Pick added that the hepatopetal collateral circulation may develop in adhesions between the liver (and gall-bladder) and the remaining abdominal viscera (stomach, intestine, omentum, etc.), as in a case of portal vein occlusion reported by Umber 7

The experimental observations that I have recorded thus correspond with the clinical findings. They also demonstrate two important points that have not as yet been established clinically—(r) that the collateral

I The exper mental work reported is uncomplete in several respects. Thus, the brefets perced in which the vers can be closed off has not been determined now whether the as mall lives anderheadey after the operation. The collateral corolation may possibly be a subserved after protonaged perceds and changer in the beet, particularly may then

he found. A clamp devised to alowly occlude the very would greatly improve the experimental technique. Halsted a clamps, as made for me in Berlin die not prove a statulartory. Metabolic studies upon animals after portal ligition would surely prove of interest. "Schmidt Liable acid.

^{*} Amatomysch Atlay pur Klin der Leberkrankh , Brannschwegt, 1861

^{*}Trant d Anst. humaine de Poirser Angéologie 1898, 11 *Varchow's Archir, Curvii

These terms originated by Pick are useful (though hybrid) ones and will be employed as this paper

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circulation develops with great rapidity; (2) that the collateral circulation in the gastro-hepatic omentum is the one that regularly

develops.

The demonstration of a collateral hepatopelal circulation is of considerable significance in connection with the surgery of the human portal vein, for ligation of the vein becomes conceivable when there is evidence that blood from the portal territory enters the liver after the portal vein is ligated—in other words, that the functions of the liver may continue in an approximately normal manner.

What are the clinical observations of the effect of complete portal stenosis upon the liver? In all the cases that have been reported (not including, of course, those of portal thrombosis associated with hepatic cirrhosis) the liver has been found of normal size and gross appearance and of practically normal microscopical structure.1 Furthermore, some of the patients have lived as long as thirty years after the occlusion has been established, with but transient if any symptoms pointing to inadequacy of the collateral circulation. Although my experimental observations were not of sufficiently long duration to be of definite value in this connection. it may be tentatively stated that they correspond with the clinical ones. Very soon after the portal vein is completely ligated the animal is in good physical condition, presents no abnormal manifestations, takes nourishment in the usual manner, and remains of normal weight Upon post-mortem examination. the liver is found to be of macro- and microscopically normal structure.

I wish to add some remarks upon the significance of these experimental and clinical observations for the treatment of suppurative pylephlebitis. The description of the symptomatology of the affection is not within the scope of this paper; however, it may be stated that pylephlebitis ofttimes presents a clinical picture that permits the diagnosis to be made with reasonable certainty. The affection, complicating appendicities especially, is not a

rare one and almost invariably ends fatally. Indeed, it is difficult to conceive of any other termination for the vast majority of the cases. Nevertheless, no methods have been employed in an attempt to check its progress. Any procedure, no matter how radical, that offers a possibility of cure of so fatal a condition should be advocated. therefore wish to suggest ligation of the portal vein for the treatment of suppurative pylephichitis. The argument, already indicated in several places, continues as follows: Although some cases of suppurative pylephlebitis end fatally with great rapidity, some live weeks and even months Especially in the latter, post-mortem examination demonstrates that the portal vein is often more or less occluded by suppurating thrombi, periphlebitic inflammation, etc Collateral paths for blood from the portal district must have been established in these instances fore ligation of the portal vein may only complete the development of a collateral circulation begun or already far advanced seriousness of suppurative pylephlebitis depends not so much upon the suppuration in the vein itself as upon the involvement of the liver. The liver may be the seat of multiple abscesses, even in an early stage of pylephlehitis; even in such instances, however, ligation of the portal vein will cut off the source of the hepatic infection and the liver may take care of those foci that have already developed in it That patients suffering from multiple abscesses of the liver may recover has been amply demonstrated. Therefore clinical evidence pointing to invasion of the liver is not, in itself, a contraindication to the procedure suggested

The details of the operation can be developed by experience alone. Should the vein be ligated in several sittings (as in the experiment) or should this be accomplished by a champ that gradually occludes the vein (such as that devised by Halsted)? Or finally, should the vein be completely ligated at one sitting? It is possible that only cases of pylephlebits that have existed for some time will prove to be operable, cases in which the vein is more or less occluded and the collateral circulation has had an opportunity to decrease.

¹ Pack (De ct.) 23) severa the trivial microscopical changes that have been found to the free on some instances of portal vice occursions.

7 There is no evide for the control of the free control of the control of th

Under such circumstances, at any rate, immediate ligation would seem the operation of choice. If thrombosis has not extended above the splenic vein, the portal should of course he ligated below that vessel. If the portal involvement has extended above the splenic vein, the latter should also be ligated, beyond thrombosis that may have extended into it, if possible. The question of procedure in involvement of the portal vein above the highest surgically accessible level must remain an open one Ligation through the thrombotic area should be considered because the source of infection of the liver will thereby be greatly diminished in area, and the bacteria will not be swept into the liver by any blood current still present in the portal vein. The problem of dealing with the pus in the vein has not been considered. It may prove feasible to drain the year, as suggested by Gerster,1 provided the blood stream in it is completely or almost completely sidetracked The possibility of excision of the thrombosed portal vein is one for the future to determine Whatever the operation of occlusion praeticed upon the portal vein, it should be combined with an omentopery This additional procedure is advocated because it may prove a valuable aid to the collateral circulation that has already developed at the time of operation or that may develop after operation omentum is partly attached to the liver and partly to the abdominal wall, it should theoretically assist both the hepatofugal and the hepatopetal flow of blood

RÉSUMÉ

z. Experimental complete ligation of the portal vein is immediately fatal. Death re-

sults from shock

2. Apparently normal life is compatible with complete occlusion of the portal vein, if gradually induced. This is true for the human being and the experiment. In the latter, gradual obliteration of the lumen can be successfully induced in a very brief period.

3. The liver remains practically normal with complete occlusion of the portal vein existing for a short time (experimentally), and for very prolonged periods (clinically). The reason for this lies chiefly in the development of a hepatopetal collateral circulation, The latter is demonstrable clinically and experimentally In the experiment the hepatopetal circulation appears to develop regularly

in the gastrohepatic omentum.

4 An active treatment of suppurative pylephleliitis is suggested on the basis of the above summarized results Ligation of the portal vein, with the modifications embodied in the paper, is the treatment that is advocated The operation is worthy of trial in an attempt to improve the results of an affection so regularly fatal

It is a pleasant duty to conclude by an expression of my thanks to Prof. Pick for his Lindness in supervising the work and for his courtesy in placing all the laboratory facili-

ties at my disposal

CONCERNING SACRAL ANAISTHESIA

BY HANS SCHLIMPERT, M. D., FREIBURGE BR., GERHANY Provat forms. Assistant in the Universitis Franchisch

MIC idea of making use of the extradural space as the place of application for different active agents originated with the Frenchman Cathelin He pointed out that it is possible to inject watery solutions into the extradural space by puncture of the lower end of the sacral canal, the hiatus canalis sacralis. By injection of cocain solu-Gerster, Tr Am Surg Assn. Phila 2003

tion he thus brought about, on dogs, an analgesia which was sufficient for surgical purposes He cautiously made use of this method on humans for the amelioration and cure of certain nervous bladder troubles. This method was then further developed by Stockel, who was the first to introduce it in Germany and to make use of it in obstetrics, and who tried to bring about painless delivery by sidetracking the sacral plexus by means of novocain and encain solutions. Stockel's method was, however, later given up by him, since the anæsthesia was only effective for a certain time in which the labor could not be brought to an end. The interest in sacral or extradural anasthesia was revived by researches of Lawen and Gros. They proved, experimentally and clinically, that the anæsthetizing strength of a sodium bicarbonate solution is greater than that of the hitherto used sodium chloride solution Lawen in particular brought forward several more modifications in the technique of puncture and injection, and reported favorable results which he had been able to accomplish with these modifications of the sacral anasthesia in operations below the symphysis.

The Freiburg Frauenklinik then continued the experiments started by Lawen, at first with his technique, then went on with its own technique to experiment in obstetrics and gynecology. In obstetrics, sacral anæsthesia as modified by Läwen was used for the introduction of the scopolamin-morphin Dammerschlaf! (Gauss), in order to bring about freedom from pain during the entire labor. In gynecology, sacral anæsthesia was used at first in performing "low" operations, that is operations the nerves of which were fed from the lower part of the plexus lumbalis; later the Freiburg clinic proceeded to expand the indications for sacral anasthesia to all abdominal operations by using the socalled "high extradural anæsthesia "

I report herewith the technique of low on high extradurula anasthesia used by us in the Freiburg Trauenklinik, the experience we have had with it, the advantages or drawbacks of the method, and finally the indications which the Freiburg clinic uses in the employment of sacral anasesthesia.

I. TECHNIQUE

The principal new points in the Freiburg technique

- 1 The combination of sacral anasthesia with a deep veronal scopolamin-morphium Dämmerschlaf 2. The alteration of position during and after the injection
 - The increase of the novocain dose.

Preliminary narcosis. We require, as well for low as for high extradural anæsthesia, the production of a deep Dämmerschlaf, in order to mitigate the pains attendant on the sacral puncture and sacral injection and to wipe them from the memory. Also to take from the patient the unpleasant impressions of the puncture, and especially the position Furthermore, we have been able to prove as a matter of experience that the depth of the anæsthesia, especially the relaxation, is dependent on the quality of the preliminary scopolaminmorphium Dammerschlif Ill patients receive r em of verenal on the evening before and 1/2 gm. of veronal on the day of operation A reduction of the dose in that 15 gm of veronal is given on the evening before, is carried out with all patients who are markedly cachectic, as, for instance, on very debilitated carcinoma patients. With all other patients we have kept to this dosage and have seen no untoward results. On the day of the operation itself the patients receive scopolamin morphium, scopolamin pantopon or of late scopolamin narcophin, with which we have obtained the best re-sults. This last combination I would like particularly to recommend because a moderately good analgesic action of the Dammerschiaf is obtained; and in addition the Dämmerschlaf lasts longer than with the use of scopelamin morphium or scopolamin pantopon, a condition which is found very destrable when some unforescen postponement of the beginning of the operation is made necessary. The dosage is as follows. We give three hours before the beginning of the operation o coo3 seopolamin and o or morphium. Then, 1/4 hours before the beginning of the operation, that is \$4 hour after the arst injection, we give the same dose, again - that is o ooo; scopolamin and o or morphium

Narcophin is a preparation put on the market by a German firm Should morphium be given instead of narcophin the dosage is the same, except that oor morphium takes the place of oos narcophin It is then better, however, to give the injection somewhat later, according to our experience - the first injection 11/2 hours, the second 1/2 hour, before the beginning of the operation The same holds good in the use of pantopon, which is given in a dose of 0 02 gm. This is to be considered as normal dosage. It is reduced by us to a half under the following conditions in old patients and in patients who have a body weight much under 105 pounds We have not set a definite limit for the age, because sende changes make their appearance in some early, in others late Ingeneral women of the working class beyond fifty years of age, and those of better classes heyond sixty, are to be considered old. It is well to control the condition of the Dämmerschlaf about one half to three quarters of an hour before the intended operation, that is, one speaks to the patient lying in the preparation room, or tests the analgesia by lightly plaching the skin If the patient is still quite wakeful, we conclude that she re-

[&]quot; Twilight aleep"

acts little to alkaloids and we give her one half of the normal dose already described, i. e., morphium 0.005, scopolamin 0.00075.

It must be here noted that the object of the scopolamin morphium Dammerschlaf is not the induction of absolute anæsthesia, s. e complete narcosis, but a condition of amnesia It is almost the rule that patients in Dammerschlaf, for example, give indications of more or less severe pain at the time of the sacral puncture They are not conscious of the pain, bowever, and forget at If one asks a patient who was injected during the scopolaminmorphium Dammerschlaf and who gave lively demonstrations of pain, on the day after the operation, or even on the evening of the operation, if she remembers having felt pain or if she remembers anything of the puncture, etc., one almost always gets a negative answer. This amnesia is a specific action of scopolamin

Technique of the sacral puncture We carry out

the sacral puncture

1 With the patient lying horizontally on her side
2 In the knee-elbow position, with the patient

horizontal or with elevated pelvis. Puncture in the side position has the advantage that the position is easily obtained, the drawback that the puncture itself is more difficult. Puncture in the knee elbow position has just the opposite advantage and disadvantage. The hiatus canalis sacralis, the lower opening of the sacral canal, is chosen as the point of entrance This is to be recognized through the skin by the two comus sacralia To orient oneself, one palpates the processus spinosi of the sacrum down to its lowest part, then feels that the processus spinosi seems to divide in a forklike manner, and thus comes upon a triangular space which is bounded on the sides by the two cornua sacralia and gives the elastic resistance of a deep-lying membrane The hiatus is easily found when puncturing in the knee-elhow position, as it lies in the continuation of the anal groove When the patient is in the side position it is somewhat above the anal groove, as in the side position the weight of the gluteal muscles causes the skin to be drawn over it. The hiatus is best found by injecting one finger breadth away from and above the anal groove The entrance is best obtained at an angle of about 45° from the body surface

Introncotarium of the sacral ameritana I Paneture needle We make use exclusively of a needle the cheef feature of which is that it consists of a hollow tube in which is a sharpened mandrin, which can be immediately withdrawn. We puncture with the mandrin pushed forward until we have entered the canal, then immediately withdraw the sharp point and introduce the empty tube, which is made cately withdraw the sharp point and introduce the empty tube, which is made cately withdraw the sharp near the sharp with the sacratic state. The sharp with the sacratic state of the sharp with the sharp with the sacratic state of the sharp with the sacratic state of the sharp with the sharp with the sharp with the sharp wi

2. The tilting chair for the production of the

knee-flow position. We make use of a specially constructed chair in which the patient can be comfortably scated. She as there away so that he hought into hence-flow position with a mone or
less elevated pelves. This rather expensive appears use can, however, be improvised if one face on the
operating table supports for the shoulders and pelvis. One can then his dit be patient to the supports
with towels, and thus easily hing ber into kneecllow position and produce the necessary amount
of elevation of the pelvis by means of the operating
table.

3 Syringe, We always use a 20 cc. record glass

SYTIMES Trial smeetion Whether or not the needle lies correctly in the sacral canal, one can discover on injecting by the degree of resistance. If the needle hes correctly the fluid is injected almost without resistance If the resistance is greater, or if on injection a subcutaneous swelling appears, then the needle has not entered the sacral canal, but is in the periosteum or subcutaneous tissue. Hence a trial injection is to be made before each sacral canal injection, in order to be certain that the canal has been entered Novocain solutions should not he used for this trial injection, one does best to inject 5 to 10 cc of an indifferent solution, such as sodium bicarbonate or salt solution. Should it be found after an injection of large quantities (10-r5 cc) that the needle does not he correctly, the patient has at any rate absorbed no active drug

Testing for incurres of the veins and lumbar cality. Even with the use of the above described puncture needle, with withdrawal of the mandrin, injuries of the veins of the extradural space can of course occur These insuries are dangerous, because the sacral spection of novocain can then turn into an intravenous injection One tests for injuries of the yeans by lowering the pelvis after the sacral puncture Injuries of the veins occasionally occur without an ammediate gush of dark red blood. When the pelvis is sunken, however, and a vein of considerable size is injured, blood will almost always issue II only a little blood runs out, then only a small vem is injured and the injection can be completed. If blood issues in quantities or in spurts, then one should by all means desist from the sacral mjection

By means of this lowering of the pelvis it can also he noted if the meaninged cavity has been injured According to anatomical examinations, the distance from the hautos surgals to the lower end of the lumbar cavity is 6 cm. Should a variation occur, however, in space of this, in which the lumbar cavity extends abnormally deep, then there exists without his test the possibility that the lumbar cavity extends abnormally deep, then there exists without his test the possibility that the lumbar cavity are seen to run out, one must of course desix, liw have not had, in our whole series of cases, a single puncture of the lumbar cavity.

Maxime and preparation of the novocain solution we still recommend for the present novocain as the anæsthesia for sacral anæsthesia. We have used other anæsthetics on 13 of our cases, but have up to the present time found novocain to be relatively the least harmful and the most effective anæsthetic

Sodium bicarbonate solution. The essential new point which Lawen brought out in his work was the introduction of the solution of sodium bicarbonate as a vehicle for novocam (see p. 489). With the exception of two cases we have made use of novocain in sodium bicarbonate solution. It was shown by the observations of Stöckel and of Länen that results may be obtained with the simple novocainchloride solution, but they are inconstant control. I likewise have given in two cases novocain in sodium chloride solution; both times the anesthesia appeared later and was not so complete as in those cases carried out with the novocamsodium biearbonate solution. It must therefore be recommended that, at least in the use of novocain, this solution always be used. Lawen has given several formulæ. We use almost exclusively the following. Natr bicarb. puriss, 0 25, Natr ehlorat, o s, Aq dist., 100

Addition of adrenalin It is recommended to add adrenalin to the sodium bicarbonate and novocain solution in order to bring about a contraction of the blood-vessels, which on the one side is thought to hinder a too rapid absorption of the novocain by the blood, and thus an acute intoxication, and on the other is thought to guarantee a delayed resoration, and thus a more continued action According to our observations, however, it seems pretty certain that the addition of adrenalin brings about no sueb appreciable delay in resorption as one might expect. It appears as if the thinwalled veins of the extradural space do not react strongly to adrenalin. If one adds suprarenin or adrenatin immediately to the sodium bicarbonate solution, it is destroyed in a few moments if the solution is warmed to the right temperature, that is, it is converted into an inactive substance by the strong alkaline reaction of the solution, this is shown by a reddish or, later, a yellowish color In order to avoid this oxydation of suprarenin we add 1/4 gm natrium sulphurosum to the novocainbicarbonate solution, for researches of Trendelenburg in Freiburg have shown that the oxydation of suprarenin is postponed for a long time by the addition of this substance. The amount of suprarenin which we add is 1/2 cc of a r 1000 solution

Preparation of the novecen solution. According as we wish to use a per cent or a 3½ per cent solution of novocain, we add to 100 cc or 75 cc. of the above described sodium bicarbonate solution 1 gm of zovocain. The niture 1s then boiled for a solution of the solution which we have been solved by the sodium bicarbonate is conveniently whereby the sodium bicarbonate is conveniently of the solution at the same time a sufficient degree of normal additional solution of the solution at the same time a sufficient degree of normal additional solutions of the solution at their cooled to 35° C, and if not used at once 1s kept best in an incubator. Dozate of norwacion. By far the most difficult of the solution is they are the most difficult of the solution at the solution at the cooled to 35° C, and if not used at once 1s kept best in an incubator. Dozate of norwacion. By far the most difficult of the solution is the solution at the soluti

chapter in the subject of sacral anaesthesia is the

dosage of novocain. The Treburg Frauenklimk has itself been able to work out a definite stheme of dosage only after a long experience, now flavorable, on the first of the fir

1. Dosage in low anasthesia Normal days of gm. In patients under 105 pounds body weight, in cachectic patients, in those who are deep in Dammerschlaf, and in operations which probably will not last over 45 minutes, only 0.5 gm, in hamorrhoid operations, 0.4 gm

 Dosage in high anasthesia is somewhat more complicated. The minimal dose is here o. gm., the maximal o.8 gm. The factors which have to be considered are: r. Body weight, 2 cachexia; 3. icterus, 4 babituation to narcotics, 5 DSm. merschist, 6. nature of the operation.

As a normal dose we take 0.7 gm. We take 0.7 gm from this dose if the patient weighs less than 169 pounds, if she is very cachectic of teteric, if she is deep in Dammersthial, and in short operations such as uncomplicated appendectomies, Alexander Adams' tubal sterilization, operations for fingunal bernar, and so forth. We increase the dose of 0.7 gm by 0.5 gm. in patients who weigh over 126 gm by 0.5 gm. in patients who weigh over 126 gm by 0.5 gm. in patients who weigh over 126 gm by 0.5 gm. in patients who weigh over 126 gm by 0.5 gm. in patients who weigh over 126 gm by 0.5 gm in patients with poor Dammerschiaf, and in long operations. We take 0.2 gm from the normal dose if the woman has a body weight under \$6 pounds.

All of these considerations can annul each other. For example, if a woman is in poor Dammerschlaf. one would add o t to the dose, if, however, she at the same time has a body weight under ros pounds. o i must again be subtracted, and these two points have equalized each other. In order to avoid an immoderate summation of addition or subtraction. we make it a rule not to use less than o.5 gm or more than o 8 gm. This dosage is so arranged that above all things the principle of safety is preserved. In many cases we could doubtless have given more novocam and thus obtained better results as far as anæsthesia and relaxation were concerned. I should advise, however, in spite of that, to hold to the cautious dosage. Very heavy persons had best not be given sacral anæsthesia at all. One does not regret having occasionally to give in combination a little chloroform and ether The doses which will be necessary are so small that they cannot produce any mentionable damage.

The position during and after the injection. For low anesthesia we almost always use the side position. We puncture in the side position, and inject the solution slowly, taking from one to one and a half minutes. The woman lies in the side position horizontally. Immediately after the injection she is brought into position on her back, and a

slight elevation of the pelvis is used, or none at all. One can usually begin the operation on the perincum in two to three minutes. It is different where one is to produce high anæsthesia. We use here the Ince-elbow position exclusively. We puncture and inject also with the pelvis elevated. The patient is brought onto the tilting chair or the prepared operating table in the Lace elbon position with moderately elevated pelvis In this position the puncture is made, likewise the injection takes place with uniformly elevated pelvis, about 30°, and finally the pelvis is still more clevated, to 45°. The patient is left in this position for about five minutes, then she is brought onto the operating table in horizontal position. High an restlicsia thereby usually sets in after five to ten minutes. The first sensitions which are lost are the lower and upper skin sensibilities; the last angesthesia to be obtained is in the peritoneum Anasthesia vanishes in the reverse order - first in the pentoneum, and last in the skin

Duration of the anasthesia As an average, the low anasthesia lasts 34 to 1 hour, or 1 to 114 hours High anæsthesia averages 34 hour, in rare cases only 1/2 hour, occasionally, however, an hour or more. It appears as if a certain prolongation of the anasthetic action is brought about by the addition of

sunrarenin Results We have carried out in all 135 low angesthesias, 21 with novocain substitution products, which cannot be further discussed here, and 114 with novocain giving the results I shall follow the scheme that I have used in my former publications

1. Good low anæsthesia of the organs lying below the symphysis, to which during the operation no inhalation anaesthesia had to be added, 62, or 54 4 per cent.

2. Good low anasthesia to which on

account of the duration of the operation inhalation anæsthesia had to be added, 24, or 21 per cent.

3 One-sided or incomplete anaesthesia which made necessary the addition of inhalation anaesthesia from the first, or soon after the beginning of the operation, 15, or 13.2 per cent.

4. Failures, 13, or 11.4 per cent. High anasthesia we carried out in 434 cases;

of these 92 were with novocain substitutes and 342 with novocain. Of these:

1. Peritoneal anaesthesia with relaxation,

150, or 46 5 per cent.

2 l'eritoneal anaesthesia with relaxation. in which, on account of the duration of the operation, inhalation anasthesia had to be

added, 73, or 21.3 per cent.

3. Incomplete high anæsthesia, i.e. in which no relaxation, but only peritoneal or skin anasthesia, or only low anasthesia occurred, 91, or 25 6 per cent

4 Failures, 19, or 5.6 per cent. It is to be noted that the amount of chloroform-ether was in general small, 10 to 15 cc of ether alone or with a few cc. of chloroform is often enough to carry out a peritoneal operation lasting as minutes to 11/2 hours All of these cases are included under headings 2 and 3 It is certain too that, even when the anasthesia is from the beginning insufficient, the amount of chloroformether and the consequent harm to the patient is much less than when chloroform and ether are used entirely for anasthesia

Collateral action The principal collateral action, and that one which most often is striking, is the extreme pallor which usually comes on one quarter to one half hour after the injection A fall of blood pressure is doubtless connected with this pallor, and both are to be regarded as novocain action. With choice of suitable doses, as shown above, there is no danger, particularly if there was no injection into the veins The pallor lasts for about 2 to 3 hours. Occasionally patients complain of chilly sensations. In a to 4 hours the action is over It is to be admitted that at first these symptoms can appear somewhat threatening On account of the fall in blood pressure which accompanies it, one of course should make it a rule not to

severely damaged hearts or vascular systems. After effects. The most pleasant thing about sacral anaesthesia is the insignificance of the after effects. Post-operative vomiting practically never occurs, an advantage which cannot be praised too highly in operations on

use sacral anæsthesia on patients who have

the stomach and intestines. Headaches, too, which follow lumbar anæsthesia so often and so persistently, do not occur after sacral anæsthesia. Those cases where we observed headache had other definite causes. It is also a priori to be expected, for the puncture of the meninges, which causes the headaches, does not occur in the sacral anæsthesia. In · our first trials there were, in all three times, after effects which at first seemed very unpleasant. They were cases of neuritis in the region of the nerves of the leg. Once a solution was accidentally injected too warm; in both the other cases the old technique, jerky injection of the solution, was used. whereby mechanical injury of the nerves is possible. Since we excluded these sources of error we have never had to complain of such occurrences.

RÉSUMÉ

Sacral anæsthesia is an anæsthesia de luxe Its execution demands a number of trained assistants, and the technique is not simple and demands long practice. The technique has not yet been worked out to the finest points. Much is to be expected from substituting for novocain a preparation which is as efficacious but less toxic.

The main advantages of the method are the lack of vomiting before and during the operation, the lack of headaches in the convalescence, and, in the successful cases, the beauti-

ful anæsthesia and relaxation which alone make possible a technically perfect operation.

The drawbacks, outside of the already mentioned difficulty of the technique and dosage, are the fall in blood pressure and the limited duration of the anæsthesia.

On the one side sacral anæsthesia competes with inhalation anæsthesia, particularly in its extended forms, as a mixed anæsthesia; on the other side, with lumbar anæsthesia. It surpasses inhalation anæsthesia in the better relaxation which it assures and in the inconsequence of the after effects; it is surpassed by lumbar anæsthesia in the fall of blood pressure and the difficulty in technique encountered in its use. It surpasses the latter, however, in one important point, and that is the absolute absence of headache. On the ground of these comparisons, the Freiburg Frauenklinik has made for itself the following indications:

For small, short operations which require only slight abdominal relaxation, e. g. uncomplicated appendectomies, we use the inhalation anasthesia with chloroform ether

or laughing gas.

For larger operations on women whose heart and vascular system is not intact, or on very fat women with a thick fat laver over the hiatus canalis sacralis, we use lumbar anæsthesia.

For all other cases, sacral anaesthesia.

OSTEOPLASTY

BY JOHN B. MURPHY, A. M. M. D., LL D., CHICAGO

N a series of articles on the surgery of the bones, joints and tendons, published recently in the Journal of the American Medical Association, I considered this

subject in many of its phases, although lack of space made it impossible to more than touch on the details of this work.

While plastic operations on the bones have been performed for a considerable number of years by many men, the subject is still in its infancy, because we have not until now arrived at the stage where we can make positive statements on practically all the emergencies which may arise in the course of this work, We have, however, formulated definite, clearcut principles which control the essential features of all this class of surgery. It is no longer in the experimental stage but is an established fact. Experimental study by many European and American surgeons has done much to develop this phase of surgery, and we are now in a fair way to reach finality.

I will not weary you with a recital of all the experimental work done by my associates and me, and anything I may say to you will be based entirely on that work and on the very extensive clinical observations which I have had the opportunity of making since 1003. when I first became actively interested in the subject, and earlier desultory work that time, particularly during the last lour or five years, I have devoted a great deal of time, thought and study to o-teoplasty and arthroplasty. My results have been such that I have been able to draw some definite conclusions, although each day some new problem presents itself which must be solved

Anyone who undertakes this work must bave a very complete knowledge and a clear conception of the embry clogy and anatomy of the bones and joints, as well as of the method ol regeneration, not only in hones, but also in the soft tissues. No matter how this work is done, it must be carried out along definite lines which approach the natural course of embryology and osteogenesis as closely as possible

I believe it may be said with some positiveness that the question of what sort of material and from what source it should be taken, in osteonlastic work, has practically licen solved While implantation of loreign material or of homo material derived from a subject of the same species is useful in a measure as a mechanical support or irritant, its utility is practically confined to a few situations in the body, and even then only a few materials are advantageously at our disposal furthermore, it is not at all a matter of supplying a defect, but of supplying the proper means which will favor the reproduction of tissue to fill in the defect. Any one who bas done osteoplastic work knows this to be true. We cannot supply a defect in a bone, but we can resort to procedures which will make for regeneration from the hone already present or remaining so as to fill in the defect.

As a result of my work I have formulated in my own mind a series of laws which must be observed if one would meet with success in osteoplasty. To achieve the best results in the work of bone grafting and bone transplantation we must observe the following

1. (a) Normal periosteum completely detached from bone and transplanted into a lat or muscle tissue bed in the same individual, if he be young, may produce a permanent bone deposit, but only if osteoblasts remain attached to the lower layer of the periosteum. The periosteum of itself is not osteogenetic: it is rather a limiting membrane, and therefore it is of advantage to transplant it with the bone, although it is not essential to do so. (b) Normal periosteum, transplanted into another individual or animal of the same' species and under the same conditions, rarely il ever produces a permanent bone deposit. Any bone which is formed from such periosteum will sooner or later be absorbed. The osteogenetic effort of this periosteum is early exhausted (c) Normal periosteum transplanted into another species never produces

a permanent bone deposit 2 Strips of normal periosteum raised from the bone, detached at one end but left attached to the bone at the other, if turned out into the surrounding tissues, usually have bone produced on the under surface, at the o-teoperiostcal angle, but not unless there are osteoblasts attached to it This is an etiologic factor of many of the eyuberant calluses in fractures in the neighborhood of joints. The periosteum and some of the osteal cells are torn loose by the muscular contractions at the muscle attachments or elevated by the fracture, and these develop traumatic exostoses.

Normal periosteum transplanted into other individuals or animals of the same species and contacting at one end with exposed or freshened bone rarely ever produces permanent bone even for a small extent at its basal attachment, and never produces bone for its Iull length

 When bone with its attached periosteum is transplanted into muscle, fat or other soft tissue in the same individual and free from bony contact, it may for a very brief period of time show osteogenetic powers, but eventually the formation of new bone ceases, and all of the bone, the transplanted as well as the new bone, is absorbed, except in the cases of very young children or infants When transplanted into another species it is always absorbed.

Free bone from which the periosteum has been detached, when transplanted into muscle or other soft tissues, always dies and is ultimately absorbed.

6 Bone, with or without periosteum, transplanted in the same individual and contacting with other living osteogenetic bone at one or both of its ends, always becomes united to the living fragments and acts as a scaffolding for the reproduction of new bone of exactly the same size and shape as the original bone, provided the most perfect asensis is maintained. This new bone subsequently increases to such a size as is necessary to give the support required by nature in the extremity in which it has been placed. It acts as a seaffold for the production of new bone-but allows the osteoblasts which are normally found on the Haversian vessels to travel into the Haversian canals of the transplant. When one end of such a transplanted piece of bone projects into a joint and when it is surrounded by the original joint capsule, the normal conformation of the bone end in the joint is reproduced almost in its entirety, such as the head and tuberosities of the humerus (Case 1) and the upper extremity ol the femur (Case 3), including the trochanters; provided the muscle stumps are fixed to the transplant, at the time of operation, in about their normal anatomic relation with sutures.

The transplant, no matter how small or how large it may be, is always ultimately absorbed It is our conviction that its rôle in the reproductive process is merely that of mechanical support for the Haversian bloodvessels and the living osteogenetic cells as they advance from the living bones at both ends and pass through the Haversian canals. canaliculi and lacung of the transplant. New lamellæ are deposited around the new capillaries, and these lamellæ adjust themselves in the graft in such a manner that a firm bony union is formed and the continuity of the bone into or onto which the transplant has been placed is re-established, and to such a degree as to give sufficient support to the limb long before the transplant is entirely replaced by new bone or the transplanted bone is absorbed.

We have had the opportunity of observing that ultimately all of the transplant disappears As the new lamellæ are formed by the osteoblasts, the osteoclasts eventually dispose of the transplant, and this building up and

teating down process by the osteoblasts on one hand and the osteoclasts on the other keep pace. As rapidly as new bone is formed in and around the transplant the old bone is absorbed. This conclusion is based not only on my personal experimental work and cliniical observations in particular, but on the analysis of the clinical and experimental work done by others.

The graft per se does not possess any sottogencile power; it merely serves an osteo-genetic-conductive purpose. The regenerative force is supplied by the ostogenetic cells found normally in the Haverslan canals and lacunæ of living bone. However, in order that this new formation of bone may be made possible, the transplant or graft is an absolute necessity.

We have found further in our clinical observations that unless the graft is firmly contacting with living bone the osteogenetic cells will not pass over from the living bone to the transplant. We have had one case (Case 2) and only one in our entire clinical experience in which that was demonstrated. One end of the transplant only was firmly contacted with living bone, and here a firm, solid bony union took place. The other end of the transplant had partly freed itself from its contact with the living bone, so that it was loose and not firm, while there was some callus formation at this end of the transplant there was no effort at bony union.

8. We have found from our extensive study of skiagrams of cases in which bone transplantation has been done that the graft increases in size on the surfaces in the same manner as the deposits of bone lamelia take place in the normal growth of bone; that is, by the piling up of the deposits of bone in layers beneath the newly formed periosteum. The periosteum, it will be observed, really serves as a limiting membrane rather than an ostrogenetic force. Any osteogenetic force which may be possessed by the periosteum is imparted to the periosteum by such osteogenetic cells as may be attached to its under surface.

9 When bone is transplanted to supply a defect in that portion of a bone which enters into the formation of a joint, such as the upper end of the humerus (Case 1) or the upper end of the femur (Case 3), the muscles in the vicinity of that joint should be fixed to the transplant or firmly sutured around the transplant in the same relation as exists normally, if muscular control and normal function of both the joint and the limb are expected after regeneration of the bone has taken place. The musculor-tendinous attachments of the muscles should be sutured accurately around the graft at the point of desired union.

10 A bone covered at the end by cartilage and at the sides by periosteum, such as the phalangeal boncs, even when contacting with living bone dies and is entirely absorbed. The interposition of any tissue, either cartilage or periosteum, between the surfaces of living bone will effectually prevent the passage of the Haversian vessels and the osteogenetic cells from one bone into the other, and failure of union is inevitable. That is a positive law. Regeneration can take place only when living bone contacts with living bone without any interposing substance, so that the osteogenetic cells can pass from one into the other If the periosteum of the graft or transplant is split into shreds or ribbons. regeneration may take place, because the Haversian vessels and the osteogenetic cells may find their way from the bone into the

transplant through the shts in the perosteum. While it is possible that these theories, which really represent our conclusions in this matter, may finally be found defective in some of the lesser details, I believe that, being based on actual clinical observations, they will be found to be correct. At any rate, from a practical standpoint it is now permanently and for all time settled that the reproduction of bone through the agency of bone transplantation is both practicable and feasible, and that the extent to which it can be carried is practically unlimited.

The essential feature to be borne in mind in carrying out this work is that the transplant must contact with living bone at at least one end. If the epiphysis of the long bone has been destroyed, the bone will not grow in length from the transplant at the point of epiphyseal absence unless an epiphysis is transplanted. I have not yet demonstrated, experimentally, that a transplanted epiphyseal line will become ostoogenetic, but I feel that in young individuals it should become ostoogenetic and in one case the X-rays show it was osteogenetic (Figs 77-80) and that the bone grew in length from the once dead epiphyseal line

If the entire shaft of a long bone such as the tibia, humerus, radius or uina be absent, then the bone must contact with the neighboring bone laterally or at one end or the other of the extremity across the normal line of the joint in order to get an ostcogenetic supply, as in the case of the femur or astragalus. Subsequently an arthroplasty can be done to give the ratient a mos able joint.

The indications for bone transplantation which we have laid down as a guide in our

work are

- To correct deformities resulting from defective development, such as aplasia of the bones of the extremities, of the nasal bones, and of the mandible
- 2 To effect union in ununited fractures, no matter how remote the occurrence of the fracture, no matter whether of congenital or purely traumatic origin
- 3 To replace bone which has been destroyed by an infection, such as osteomyelitis, tuberculosis, etc.
- 4 To restore or supplant such parts of bones as may have been dislodged or destroyed by fracture, as in the case of a fracture through the head of the anatomic neck of the humerus or femur, etc
- 5. To replace bone which has been removed because of its having been the seat of a nonmalignant neoplasm, such as a cyst, a myeloma, or ostellis fibrosa cystica, etc.
- 6 To replace bone which was removed because of having been the seat of an encapsulated mahgnant disease, such as a chondrosarcoma or fibrosarcoma
- In all cases in which we have been called on to resort to the transplantation of bone we have come to feel that the best results are obtained when the graft or transplant is taken from the crest of the tibia of the same patient. The tibial crest furnishes a splendid supply of bone suitable for transplantation; it is easily accessible and transplants of any length may



Fig. 1. The author's medulla reamer. This instrument is made in several sizes. It is used to ream out the medullary canal to receive the transplant.

be removed from it, and the defect is rapidly filled in by the osteogenetic cells of the re maining portion of the tibia. It does not weaken the strength or the weight-bearing power of the tibia, the patient is not incapacitated by the removal of such a graft, and other grafts may be taken from the same tibia at a later period when the defect has been filled in by new bone, if such a procedure is indicated. We have had to resort to it in one case (Case 4), that of a 5-year-old boy, in whom we were obliged to do a second transplantation. We found on cutting down on the tibial crest from which the first transplant had been removed, about six or seven months previously, that new bone had been formed in sufficient quantity to fill in the defect

The transplant should be of sufficient size to give firm mechanical support It must not only be long enough to span the gap left between the fragments of bone, but allowance must be made for the fixation of the transplant by inserting it for a distance of an inch or an inch and a half into one or both medullary canals of the remaining fragments, or when the transplant is made to serve as a bone splint, when it is not possible to insert it into the medullary canal, allowance must be made for fixing the transplant firmly to the sides of the fragments (Case 5), in other words, making a lateral approximation of the transplant to the fragments It is then held securely in position by means of phosphor-bronze wire or chromicized cateut.

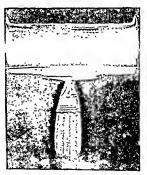
Usually the transplant is of the size of the adult index or middle finger. The sides may be unequal, so that the transplant which we have been in the habit of using measures about 36 by 35 by 38 inches, and of such length as is necessary, even to the full length of the tible from the tubercle to the malleolus (Case 17). It must be sufficiently firm to be resistant to the forces exerted on it by the

contraction of the muscles. It may or may not be covered by periosteum, because as stated previously it may be advantageous to retain the periosteum, but it is not essential.

The defect that is left in the tibia fills in so rapidly that in from four to six weeks the site can scarcely be detected. After having determined on the length of the transplant by means of calipers, corresponding marks are made on the crest of the tibia as guides in the removal of the transplant. The transverse division of the bone, above and below, is made with a small saw, preferably a Hey's saw,



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Figs 2 and 3 Side and top view of the author's retractor guide. The points upon the ends of the guide are inserted into dull holes in the lone so as to steady the instrument. The chisel is guided by the upper surface of the instrument. It also retracts the soft these from the field of operation. before the fragment of bone is chiseled away from the tibia, because otherwise it is liable to split. The ordinary Buck chisel or cabinetmaker's chisel is used to free the transplant or it may be freed with a Zapffe saw attached to an electric or hand drill, which we are now using mostly in our work. The chisel is guided by a special retractor-guide (Figs. 2 and 3) which I devised, and which is one of the few special instruments used by me in this work. The chiseling must be done very carefully in order to preserve the integrity of the transplant The medullary canal of the tibia may and usually is entered. The transplant is lifted up very carefully with two pairs of sequestrum forceps so as to prevent its slipping, and at no time is it allowed to come in contact with any other material or with any instrument or even a sponge that has touched anything else.

It is absolutely essential to success in this work to maintain the strictest asepsis. If this work is done in an aseptic field and in an aseptic manner, and if primary union of the soft parts is secured, the result is uniformly good. In 100 per cent of our cases up to date, asepsis has been attained.

Indications for bone transplantation are as follows.

1. Congenital or acquired defects of the nasal bones can be remedied by transplanting a periosteal covered fragment of the patient's ulna, tibia or fibula of such shape and sue as is required to remedy the defect. The periosteal covering should be directed outward, and the free medullary margin of the bone inward.

The transplant must have a bony contact with the frontal bone itself, with a surface that is freed of periosteum, or with the nasal process of the frontal bone, or with the periosteum-free surface of the nasal bones. It must be fixed in this position.

The incision in these cases should be made on the side of the nose, and the flap elevated so that the graft will be completely covered with skin, and there will be no tendency to separation of the edges or exposure of the graft to air after its implantation. If possible, it is best to make a small incision near the tip of the nose, and then elevate the periosteum and make a subcutaneous pocket extending from tip upward onto the frontal bone. Into this pocket the transplant can be placed safely and securely and the opening then closed accurately. Phosphor-bronze wire or chromicized catgut may be used to secure the fragment. A long fragment of bone should always be prepared, and when it is inserted it can be cut to the desired size and fitted into its bed.

If the nasal or frontal sinuses are open, the operation should be abandoned for the time being, because if air comes in contact with the graft, the latter will become infected and necrotize, and it must subsequently be removed.

In 1899, I grafted the second phalanx from a case of byperdacty into the nose. All the periosteum and both of the cartilaginous ends were retained. It bealed in beautifully and for some months it seemed to be a perfect result Within fourteen months the entire tennplant had disappeared. The reason for this occurrence was that the graft was entirely covered with periosteum and cartilage, so that Haversian vessel invasion from the nasal or frontal bones was not possible.

In 1901 I grafted the hypothenar eminence of the hand to the nasal bones by a two weeks' fixation of the hand to the head I took with the graft the fifth metacarpal bone shaft, and without bony contact it continued to live, because it was a part of a continuous living tissue transplant, and fulfilled the purpose for which it was intended.

In this case the bone retained its vitality because of its being contained within the fleshy flap. It did not become a dead fragment at any time, and therefore it did not need bony contact with the nasal or frontal bones

Defects in the chin from dislocation of the mandible may be filled in by bone transplantation (see report of Case 6).

2 The repair of ununited fractures is one of the most important and practical fields for bone transplantation. It is unnecessary to consider fere the causes of non-union, except to accentuate one fact that the skiagram brings out very clearly, namely, that nonunion occurs frequently when the approximation of the bone ends is quite perfect and the fragments thoroughly immobilized, either with or without Lane plates or other external or internal supports. The skiagram shows in these cases that there is no osteogenetic effort on the part of the periosteum, medulla, or compact bone tissue to span the gap with new bone. It is also a clinical fact that freshening, irritating, rubbing, wiring, or nailing these ends does not in a considerable percentage of cases stimulate the formation of an ossific callus These failures are so numerous, that a means more constantly and uniformly successful than these mechanical fixations, without additional hazard, must be sought.

The procedure employed in implanting the transplant into the new bed will be considered separately as we take up the various indications mentioned for transplantations

It requires from forty to sixty days, or even longer, for the graft to become firmly attached, and therefore an external case should firmly support the limb during this time Although it feels firm to the palpating finger within twenty days, it must not be strained until ample time has elapsed for complete regeneration to take place. It requires from seven to ten months to have a bone fully restored to the normal size.

3 The replacement of bone for osteomyelitic defects, as necrosis, etc., presents features not previously considered. There is usually a large sequestrum and a considerable suppurating area. The sequestrum must be completely removed and the suppuration must be entirely overcome and the wound healed before transplantation can be done If it occurs in the leg, and particularly in the leg of a growing individual, the entire shaft of the bone may be involved.

The length of the extremity can be maintained during the suppurative period by implanting the head of the fibula at the knee under the epiphysis of the tibia. When this is done, however, the upper end of the fibula, including the epiphysis, must be removed, because otherwise there would be two epiphyses, that of the tibia and that of the fibula. By removing the fibular epiphysis and transplanting the fibula under the tibial epiphysis. the normal growth in length of both bones of the leg is secured and maintained If the shaft

of the femur or humerus is involved, extension of the leg or arm must be maintained until the sequestrum is freed and the cavity healed, otherwise contraction will occur and interfere materially with the successful outcome of the case If the periosteum is not destroyed, and with it some small fragments of bone are retained, a foreign body, such as a tube or column of magnesium 1/3 to 1/2 inch in diameter, should be inserted into the granulating wound and contact at both ends with the remaining bone, even in the presence of infection.

It will thus prevent the shortening. This is more desirable and applicable to a necrosis of the femur and humerus than in the case of disease of the tibia or either bone of the fore-The magnesium will be entirely surrounded by granulation tissue If the periosteum has not been destroyed by the osteomyelitic process, an involucrum of bone will form around the magnesium and the latter will ultimately be absorbed. Carbonated water, weak alkaline, or mineral acid solutions (1 to 5 per cent) may be injected to dissolve the magnesium after it has fulfilled its purpose, if it does not disappear after a reasonable length of time has elapsed. usually is rapidly dissolved by the wound secretions with evolution of hydrogen gas This hydrogen gas is eventually absorbed into the tissues, but it may be removed by aspiration

When the sequestrum is removed and the space is covered with cicatricial tissue or skin. a fragment of bone from the crest of the tibia may be transplanted into the scar tissue at the site of the former bone. It must contact above and below, or at least at one end, with osteogenetic living bone denuded of its periosteum It is preferable to have it contact at both ends

A small contacting area may suffice to supply the Haversian vessels with osteogenetic elements, as was beautifully illustrated in one of my cases (Case 7). Here the contacting areas above and below were not larger than the surface of an ordinary lead-pencil, and still there was supplied sufficient osteogenetic force for the full reproduction of the tibia to such an extent that it could scarcely be believed that it was a new tibia were it not for a hole that remains in the upper end and which is plainly seen in the skiagram.

The periosteum over the living ends of bone must be removed carefully and the implant must be immobilized and firmly approximated at each end with phosphor bronze wire, nails or screws or any other non absorbable material which would insure continued immobilization.

In tuberculosis of the shaft, a rare condition in fills country, but a common one in Section4, as shown by Mr. Stiles, the periosteum can be preserved, and preserved aseptically, as a rule. Here the bone can be reproduced bully without the implantation of a fragment of bone from elsewhere, but it will be evolved more rapidly and the conformation of the hub more perfectly maintained if a fragment of bone fills in the gan

If hone is not accessible then a bar plate or perforated cylinder of magnessum may be inserted to maintail the normal conformation of the extremity during the process of evolution of the involuction of bone around the foreign body. As stated before the magnetium will disappear in time by absorption

In the removal of a tuberculous shaft in the child, the periodium should be treed from the bone, divided crosswise and the shaft evulsed from its epiphys cal attachment. The epiphyse must near be divided in children, therefore, the bone should be frastured on the shaft side of the epiphyseal osteogenetic line. The gap then remaining should be filled with some non-classic compact supporting material during the teriod of regeneration.

material during the period of regeneration In all of these cases (a) it is desirable that the sequestrum be removed early and completely, (b) also that the infected shaft be removed before a mixed infection of the pennostrum takes place. (c) the apphysis must never be disturbed in the case of children; (d) the normal conformation and length of the limb must be maintained either by internal or external meclanical supports or vectorion, (e) the joints above and below the infected zone must be controlled carefully so that no deformity will result during the infammatory process of destruction or during the period of restoration and repair, as these articular delormities are often more detrimental to the patient than the primary ission. Over this we have practically complete control if we take the necessary precautions early.

4. In fractures of the neck of the himerus there frequently occurs luxation of the head out of the plenoid cavity and before union can be restored one is often required to detach the head completely and replace it in the plenoid cavity. In these cases it becomes necessary to esparate it entirely from its vascular supply. It then becomes a graft, as the fragment always dies and is replaced by new bone.

In this treatment the head is removed from the sub- or periglenoid space, brought out on the table, the end of the fragment is freshered, and accurately applied over the field. It is secured in this position by one or two eight penny nails, driven through the humeral shalt into the head, by an ivory peg, or a bone peg may be taken from the tibit and used in place of the nails. I believe that the wife mask till all the inductions and meet all of the requirements in these cases. This gives no posture constact and immobilization for treatmission of the osterogenetic elements from the neck, into the head.

The bone rapidly regenerates from the neck side and the newly transplanted head retains its full shape and size (Cases 8, 9 and 10)

The head of the tenour may also be luvated or, when separated from the neck, it may become necrotre through its retention and the separation or strangulation of the ligamentum teres. In the secondary operation it should be managed as above As in the humeral separation, the head should be retained or replaced in the acetabulum and secured there either with a bone peg or two wire nails, which I prefer.

As shown in one case (Tigs 77-80), full regeneration of the head takes place without and losis of the joint following. In this case the time that had clapsed between the date of the injury and the operation was seven weeks. The head of the bone had been mectotic for that period, still its Illaversian canals acted as transmitting tubes for the softengenetic capillaries coming from the living end of the neck of the femur. The piphyseal cartilage of line acted as a con-

tinuous osteogenetic force, as shown by the skiagram of the case four years after operation.

This forces me to the belief that a dead aseptic head of the femur from another individual might be transplanted into the acctabulum and grow, as it has in this case. The practical clinical test and demonstration of this belief, however, is left for the future.

When the head of the femur has been destroyed by absorption, due to its separation, with a fracture of the pelvis (Fig. 40), it can be reproduced by excising four fifths of the trochanter with its cartilaginous ligamentous cover and as much of the external margin of the shaft as is necessary to fill the defect left in the neck of the bone. This trochanteric fragment can be nailed to the freshened end of the neck, with the nail-head pointing toward the articulation. If it remains aseptic, regeneration of bone will take place through and into the transplanted trochanter, and the latter will make an excellent head This was demonstrated in the case mentioned above This man can now place his entire weight on the new head; he can lift his leg and extend it horizontally at right angles to the body when in a sitting position, which he could not do before the operation, and he can by muscular action swing it over onto the opposite knee. which shows that he has developed a new bead for his femur, because otherwise this motion would not be possible. This case also supports my belief that a new head may be transplanted from an aseptic cadaver

The trochanter may be used in the same manner in the reproduction of a head for the humerus, in cases in which anhylosis exists, or in which the head has been destroyed by

disease or injury

The eather these operations are performed the better the results should be, as hut little shortening will have taken place before the operative procedure is instituted. This favors a speedy full restoration of motion and function. (Cases r1 and 12.)

5. The restoration of bone removed for non-malignant neoplasms, such as osteofibrosis cystica, hæmorrhagic cysts, myeloma, etc., has also been accomplished successfully. The bone should be removed for a sufficient extent.

with or without its periosteum, depending on one's ability to make a diagnosis from the gross appearance as to the probability of malignancy. If the periosteum can be preserved, regeneration of bone will always take place, but the conformation of the limb and the speed of reproduction and restoration of usefulness of the extremity are greatly facilitated by the implantation of a fragment of bone from the crest of the tibia. Where the periosteum is removed, it is essential that the implant contact with the living bone at least at one end, so that living osteogenetic elements can pass over into the transplant.

The best plan is to implant the fragment into the medulla and to prevent its penetration to a deeper degree than that desired by blocking it with a nail placed transversely, as has been mentioned previously. If the articular end of the bone has been removed, one end of the transplant should be inserted into the capsule and relieved from pressure by an extension until such time as a soft callus or a mass of fibrous tissue has formed about the implant to fix it The muscles should be sutured around the implant in their normal anatomic position In one case (Case 1) 71/2 inches of the shaft of the humerus with the epiphyseal line and articular end were removed. At the end of five weeks, on palpation, the humerus appeared to be as large as a normal humerus, although the skiagram showed small calcareous deposits only here and there. The development of compact bone proceeded along definite lines -from extensions of the periosteum, from the medulla, through the implant, up to the capsular attachment and into the joint, as shown in the last skiagram, taken nine months and some days after the operation.

Here also can be observed the evolution of the tuberosities at the points of muscular fixation. The transplanted periosteum remained as a white line without ossification for seven months after the implantation, and it was an apparent detriment to the production of bone. It was finally involuted by bone formed from the new periosteum around the new-formed callus.

This shows how completely the humerus can be regenerated and how perfectly function of the extremity can be restored in cases in which formerly amputations were made. This patient does not know from anything, except from her inability to elevate her arm up close to the side of her head in an extended position, that any operative procedure has been performed on her. This case shows how completely a new hone may be produced from a transplant, and how it enlarges to meet the anatomic and functional recognizements.

In the mycloid tumors excision of the diseased area well above and below the neoplasm should be the practice, and a bone fragment should be inserted to fall the gap. The same line of treatment is applicable in the case of harmatogenous cysts, as these are occasionally infected and it is not safe to resort to curettement and implantation of a fragment of bone.

In septic osteomyelitic cavities fragments of bone should not be used for filling material unless the cavity is rendered absolutely sterile, and of this one can never be certain, except as the subsequent course of the disease may indicate. The aseptic blood clot of Schede will give as good results as the implantation, if asepsis is attained. The bony canopy of the osteomyelitic abscess should be retained attached to the periosteum and soft tissues after the plan of Tillmanns and depressed into the cavity at the completion of the operation but still attached to the muscle flap.

6. For malignant disease of bone, such as giant cell sarcoma, large spindle-cell sarcoma, encapsulated chondrosarcoma and circumscribed intraosscous sarcomata, both the bone and periosteum can and should be removed for a considerable extent above and below the malignant focus A fragment is then implanted to fill the gap. We know that a giant-celled sarcoma can be removed by a local operation and the patient survive without local or constitutional recurrence for years. We also know that the same thing is true, in a smaller percentage of cases however, in the cases of chondrosarcoma. In a still smaller percentage of cases the removal of a spindle-cell sarcoma by a local operation without an amputation can be accomplished and the patient live for years without recurrence.

This has led me to bope that the early removal of these neoplasms while they are still circumscribed and encapsulated should give good results. The bone can be removed to a considerable extent with its periosteum, with its musculo-tendinous attachments, and still an excellent functionating extremity be preserved. With this operative outlook early operation will be conceded by the patient, whereas early operation is practically never conceded when amputation is suggested.

In one case (Case 3) Iremoved 5% inches of the upper extremity of the femur for a chondrosarcoma of the trochanter, which originated from a trauma received two years previously. The skingram showed that the sacoma involved the trochanter and a portion of the neck and of the sbaft for a considerable length dommard. The trochanter, neck, head and shaft, with their immediate muscular attachments, were all removed.

An encapsulated chondrosarcoma of the upper end of the tibla followed a trauma (Case 13) It did not involve the articular end of the bone for its entire transverse diameter, but it did involve it lully at the internal tuberosity. All of the diseased tissue was removed, but the epiphyseal line and the portion of the epiphysis close to the fibula were retained

A fragment was taken from the opposite tibia and inserted at the lower end into the medulla for hall an inch, and at the upper end into a pocket in the head of the tibia especially prepared for it. Close to the fibular attachment a nail was inserted transversely in order to prevent the fragment from burying itself too deeply into the cancellated tissue.

The joint was opened during the operation, but its capsule accurately approximated at the closs of the operation. The ligamentum patellar and internal hamstring tendors were fixed close to the surface of the implant by phosphor bronze wire and chromicized catted. A Buck's extension was then applied to the limb and the latter placed in a wire gauze cast. Primary healing occurred.

The skiagram showed the upper end well embedded in the remaining fragment of the fibia, the lower end in the medulla and ostal regeneration taking place at both ends This



Fig. 4 (Case 1) Ostettis fibrosis cystica involving the upper extremity of the humerus for about one third its distance. The articular surface and head appear to be intact.

patient was up and about on crutches in the fifth week She was examined by me on March 1, when she had about ten degrees of dexion of the knee. voluntary and without pain She also had power to extend the leg through the ligamentum patelliz attachment. By palpation the tibal end appeared to be of normal size. There was no evidence of return of the neoplasm. The skiagram shows that in the soft callus there is as yet but a small bony deposit. A skiagram made one year after the operation shows that bone regeneration is progressing well.

The malignant disease had been present so long in these two cases that it is questionable whether there may not be a metastasis in some other portion of the body I believe, however, that the disease will not recur locally, and we have obtained in both of these cases advantages which we could not have obtained by an amputation.

I believe that this line of work offers a fairly good field in that consent to its performance can be gained so very early in the disease. and in the cases of giant-celled sarcomata good results can be obtained by excision of a portion of the bone without amoutation. In order that this work may be made available for those who are willing specially to prepare themselves to perform these operations, I will give a detailed citation of illustrative cases I feel constrained to say that the work should not be done except by those who have specially prepared themselves for it by doing each and every operation on the cadaver one or more times and by studying the minutize of the technique of each individual operation. It was the plan we followed and it worked out so well with us that we suggest this course for



Fig. 5 (Case 1) After removal of diseased hone, a transplant 7% inches in length was removed from the opposite bina and the lower end was drive into the medullary canal of the humerus fragment and held in place with a small were anal. The upper end of the transplant nas placed in the glenoid cavity and the capsule satured



In a (Case 1). Non months after on ration. The upper curt of the humares has been it generated to a considerate extent including the tule needed and the articles with a The white line, thirds to the right of the central arts of the less person of shall it greents the perso-team which was not on the trund of.

OSTEINS FIREBUSE CASTICA OF INTERESS CASE 1 — Patient — Miss M. C., aged 10, admit ted to Mercy Hospital October 11, 1910. The skir gram in this case (Fig. 4) showed the nature of the disease. The diagnosis was obsettly filtering system. The book thist undergoes a filtrous deposity producing small cystic cavities in small areas while a filtrous myse by present in others. This patient had been subjected to mercurial treatment which yielded

negative results. Treatment -- Operation, October 14, 1910 An incision was made along the anterior border of the becapital groose, extending flown below the attach ment of the deltoid. The muscular attachments were separated and retained in position for recog rition The hone was then freed from all of its surrounding tissue kaying the periosicum attached to the bone. Six and a half inches were excised. including the head and epiphy seal line 1717 toch transplant was propared from the crust of the tibia, the periosteum was retained This transplant measured 76 by 4 by 1 inch The medula of the remaining portion of the shaft of the humerus was gramed out and the transplant inserted for three fourths of an inch A nail was then passed through a deil hole teansyersely to prevent it from embedding uself deeper. The upper end of the implant was inserted into the element cavity and the capsule accurately sutured around it The muscle enils were then attached by an encircling suture around the implant in about their normal anatomic position (lig 5) The wound was closed by a deep row of catgut sutures and superficial horschair sutures The arm was dressed in abiliation at about a right angle to the body A Buck a crtension was applied to the forearm and a to pound weight attached with a line running from a pulley. This was to prevent mu-cular contraction during the period of regenera tion which would probably drive the upper end of the bone through the capsule. It was kept on for

that weeks

Reath — There, was complete permits union and
at the end of lace weeks the huminus apparticulon
at the end of lace weeks the huminus apparticulon
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to which the could extend her arm who she left the
bespital (November 16 100 to the weeks after operlation)) showed how much abduttion was produced
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ligs 7 and 8 (Case 1) Patient has full power of extension and flexion of the arm, with ability 10 place her hands on her head

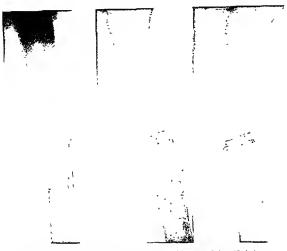


Fig. 9 (Case 2). Ununted fracture of the humans, at the junction of the upper with the middle that the junction of the upper with the middle that the junction of the upper could be transplanted. The upper could be transplanted in the reamed out modulary canal of the upper homers. Figure 1 the lower could be the medialized canal of the upper homers. Figure 1 support to the transplant is the medialized canal of the upper homers. Figure 1 support to the transplant is

the lower fragment. The sequestrum was need to get further support to the transplant. Fig. 11 (a.e.) Sharram made four mounts after operation showing that the lower end of the transplant was not fixed and that there was no born unon such the humeron fragment. The upper end of the transplant is firmful united with the home. The sequestrum is undisturbed.

It also shows the pernoseum remaining intact and not becoming ossified even after this late date by that it would appear that the pernoseum on the transplant is a detriment rather than an advantage Serial shargeams of this case were taken every leaves belowing the condition, so that a carried study could be made of the progress of bone development of the progress of bone development with the most important next from the medalia. This rapidly shot upward around the transplant to the capsule of the point (Fig. 6).

The progress was then more slow. She can now abduct her arm to a right angle in extension and flexion is likewise complete so that she does not

know that any serious operation has been done on her arm so far as its usefulness is concerned (Figs 7 and 8)

By studying the shiagram (Tig 6) one can observe the stages of reproduction very well At the end of five weeks, on palpation, the humerus appeared to be as large as a normal humerus, although the shiagram showed small calcareous deposits only here and there. The development of compact bone proceeded along definite lines—from extensions of the personseum, from the medulla, through the

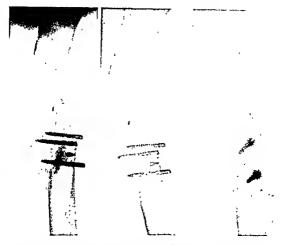


Fig. 12. Com: Suggram taken shortly after second operation. The lower end of the transplant was replaced in its leaf and toned to recent of the warrant. For second of the transplant in place against the lateral wall of the modulary, and the third section of the transplant holder is done.

In § §§§ 22). Magram taken is month-after soon beyeast in, showing complete fracture of the transplant log §§§ 222. Magram rade one most latter thord spectation. The best than sholl on the right is the next transplant, which is several to the lover fragment to means it two screen. The first transplant, consisting of two powers on the left.

implant, up to the capsular attachment and into the joint, as shown in the list skingram picture, taken nine months and some days after the operation (Lig. 6).

Here also can be observed the evolution of the tuberosties at the points of muculisr fixation. Again it will be noted how the transplanted perusteum remained as a white line for seven months after the duplantation, and that it was an apparent detriment to the production of home. It was finally involuted by bone formed from the new periosteum around the new formed callus

This shows how completely the humerus can be regenerated and how perfectly function of the extremity can be restored (1 igs. 7 and 8) in cases in which formerly amputations were made.

INCHITE PRICEIRE OF BUNERIS

CASE 2 -1. L. male aged 24, Junuary 20 1912, sustained a compound communited fracture at the junction of the upper and middle third of the right



Fig. 15 (Case 3) Chondresarcoma involving the upper extremity of the femure but not the articular surface of the bone

humerus by being struck on the arm by the limb of a falling tree. So far as could be ascertained from the patient (be spoke little English) the wound discharged for three weeks. Reduction of the fracture is said to have been attempted immediately by ma inpulation and the arm dressed in a wooden splint. No union after three months (Fig. 9)

The skiagram showed the fracture at the point mentioned above with a sequestrum about one inch in length lying between the main fragments of the shaft. There was no apparent effort at union. The patient could not use his arm because of this false joint.



Fig. 16 (Case 3) Specimen removed at operation and split into hilves. The disease appears to motive mainly the greater trochanter the upper surface of the neck, and the hone below the trochanter. The head is apparently free from theses.



Fig. 17 (Case a). Stageston made shortly after opera tion. The upper end of the transplant is in the actabut tion. The bows and six in the medulary canal of the formy. The bows rad presents the infliend of the transplant, the upper and marks the point where the muscles are fixed around the transplant. It was this and which caused the fracture of the transplant. The small fragment above and to the left is secured to the main fragment parts above of phosphor bronze, were survey. Regeneration of bone is attend; staling plants.

Treatment - This man was operated on twice The first operation was performed April 16th A longitudinal incision between the deltoid and bicens muscles exposed the fracture freely The lower end of the upper fragment was adherent to the skin It was carefully freed, avoiding the musculospiral nerve and the vessels. A band of firm connective tissue between the fragments, which had prevented union, was cut The lower fragment was free The sequestrum was not removed. The medullary cavity of the upper and lower fragments was enlarged with the reamer for a distance of one inch preparatory to inscring a bone transplant piece of bone five miches long by 18 x 5% of an inch was removed from the crust of the patient's right tibia in the usual manner and shaped at the ends with bone cutting forceps to fit the cavities previously prepared in the upper and lower fragments of the This transplant was first inserted and then driven into the cavity in the upper fragment and then slipped into the lower fragment, the



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sign districts tain 2 mass. 9/11 As a 1 sof the tringlin. In the play he for submission of the Engrittemin at Ego ditional support the transplier of a great section minted the mine lear a francis. Blir sk. was with the chair from Land Committee Control of the Land Control of the Control of with I with a lose to garder. A good off sale of groups through wise that egg of life offens was Peter fair night organ bedan filled fill et the facts and dood for including wife, consider a physical t Principle The Errol was tree. The would extra lights charbeith aget at the betat dusted scilal with collecting a contract passe of siles. given dissing judger North Northan All stitches wite feltine fall of it works. He and was remoded to the one I all

Patient returned at Angels because of tidan of minor. He had been it with a clear to and palish ting metal and woodwark to an three facilities constructs using the few for the affected arm. He wore a plaster cast after the time but becomes or the use of his hand and among a single the cost did not give him the reckel cappear skingtom should that the transplant had become titudy united with the upper trig neid that he t with the limit. It apprisently it is truly moral by in the cavity in the lower trigment. The sequestrum was undistailed (Fig. 1)

The second operation was done long as lonlongitudinal mersion to the outer side of the old



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The would was alosed with the prestrate tures in Horsehair suti ter dueted with limiths il od 'e and walch with collection give. A speciential plaster cist immedilizing the shoulder aim and

Mont are months after the second operation the paramagna leadined his aim in the mile of the trunsplant. He was carrying a large, bears

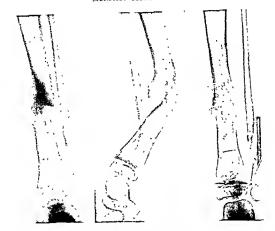


Fig. 31 (Case 4). Autor-position was showing lattle deformus, except of fibula. The lines of fracture are apparent, although some union of the this seems to have occurred. The fibular Ingaments are widely separated. The six (Case 4). Lateral view, aboung how the upper fragments of the fibula and this rest on the lower fragments, forcing them downs and and forward, thus producing the angular deformity.

forcing them downward and forward, thus producing the angular determiny.

Fig. 23 (Case 4). Two pieces of bone were removed from the opposite tibta. One piece was implanted into the
tibta in the usual manner and after the usual preparation. The second piece was contacted with the upper fibular
frament and embedded party in the lower fragment.

leather couch with a fellow-workman. The latter dropped his end and when it struck the ground the full force of the blow was imparted to the patient's humerus and the fracture occurred (Fig. 13)

A third operation was performed and the second transplant was inserted into the himerus. The bone was again exposed from the external aspect of the arm and both fragments were grooved on the lateral aspect to rective the transplant. It was firmly wedged into the upper fragment and fixed to the lower fragment by means of two screws (Fig. 14). The first transplant was not removed with the contraction of the properties of the contraction of the contraction of the courtener of new minor. The arm was again immobilized in a body east which the patient is still wearing.

MALIGNANT NEOPLASM OF FEMUR

Case 3 - Mr N, age 41 admitted to Mercy Hospital September 14, 1911 In August, 1900, while riding a bicycle down an incline, he suddenly lost control of his wheel and fell, striking the curbing on his left hip Got up and walked with some difficulty and had severe pain for two or three hours following the accident In September, 1909 while at work, he received another injury to his hip. Had sharp shooting pain in the lumbar region Pain was very acute until the next day, when it changed to a dull ache Patient when sitting down would lean forward and to the right side When getting us would straighten slowly on account of the pain in the hip When he stooped down he would at timen have to crawl up on his limbs with his hands, as does a child with tubercular spondylitis. This ache in

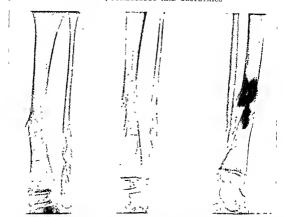


Fig. 24 A Shingram made five months after the first operation uniterior view. The fibula is intact, with firm bony union between transplant and fragments. The tibus apparently is also united but reference to B (lateral view) shows that the transplant has been fractured. C Last skiagram made four months after the second operation, when a second transplant was placed in grooves made on the anterior surface of the tibra fragments. The shadows of both transplants may be distinguished, that of the second superimposed on the first (Case 4)

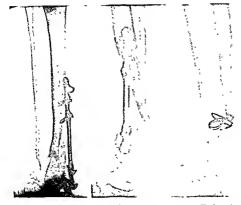
the hip continued until March, 1910, when the trouble became more annoying Whenever patient walked a great distance, the hip would become very Since that time has used a cane and a crutch Pains have been increasing in severity so that now he can walk only about half a block, when he becomes very greatly fatigued Patient walked with the leg in abduction and has very limited motion at the hip joint In February 1911, he was treated with electricity and massage without any relief, and following this took injections of sodium caredy late without result. Patient at this time began to notice shooting pains in his left limb, coming on especially at night. In January of this year had two weeks of incessant night headaches, lasting from bedtime until morning Was very restless and slept poorly Has no cough no temperature with present trouble or preceding the present trouble Has lost twenty four pounds in last year Had lues 18 years ago

Examination - The skiagram (Fig. 15) showed that sarcoma involved the trochanter and a portion of the neck and of the shaft for a considerable length downward

Treatment - The trochanter, neck, head and

shaft with their immediate muscular attachments, were all removed (Fig. 16)

A fragment of bone 312 inches in length was taken from the opposite tibia and inserted into the medulla of the femur at the distal end and the proximal end was inserted into the acetabulum and surrounded by the capsule A nail was ilriven through a drell hole in the fragment at the trochan teric level to which the muscular attachments could be fixed thus preventing motion of the fragment and at the same time securing the future function of the feg Later in the operation, when pressure was put on, the bone split at this point The fragments were immobilized by a circular wire and catgut hgature The muscle ends were drawn



Figs. 25 and 36 (Case 5). Stargram made after second open operation. The Lane plate was attached to the this fragment, but did not result in bony union. The antero posteror view might lead one to believe that union had occurred. The lateral wave shows marked displacement and separation of both fragments.
Fig. 27 (Case 3). Stargram made after the third open operation done in Copenhagen. The ends

of the tibia fingments were nired together, but with the same result as before, bony union failing to take place

around the shaft in various positions approximating as nearly as possible their normal location. The wound healed per primam. Extension was applied to maintain the full length of the thigh during the process of regeneration.

The shigram (Fig. 17) shows the evolution of bone from the medulla and from the periosteum of the living bone, making a bony involucium around

the soft callus
In eight weeks the upper end of the femur, judging
by external manipulation, appeared to be of led
size. The skagaram, however showed only here and
there bony deposits. Regeneration is taking place,
as can be seen in the most recent skagarams taken
three months after the operation between the split
fragments and well up into the acetabulum. The
patient is going about on crutches and suffers but
that pain. He is not permitted; vel (i months after

operation) to put any weight on his leg (Fig. 17).

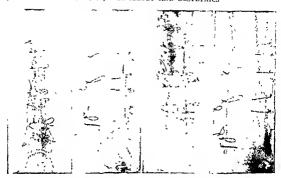
The extensions were removed at the end of three months. It appeared to me after operating in this case that it would have been a good plan to use

bones from the embryo to surround the compact bony tissue that was taken from the patient's tibia, because this might stimulate regeneration or act of itself in the reproduction of bone

One year after the operation the patient was able to abduct adduct swing and rotate this leg. He could also cross it over the other leg when seated Up to this time, he had not been permitted to place any weight on the leg. The skuggram (Fig. 18) shows that bone regeneration is progressing satisfactorily

UNUNITED FRACTURE OF TIBIA AND FIBULA

Case 4 — G S, male, aged 5 years, entered hospital because of an old unburted fracture of the tibas and fibula at about the junction of the middle with the lower thand Several attempts had been made to secure unnen, without success. The tracture is behaved to have been of congenital origin. The contraction of the fibula is lower than that of the that is the low.



lay 3 and 20 (Low 9). Surgram taken foor months after operation. The bones are in perfect alignment, the pithinh. This anteroposition raw shows that then justices in separation ground, The longer end of the translant in this cas, was driven down through the emphysic of the lower fidular fragment. The upper end was contacted with the fibrill liketity. The this fragment was driven more the mediculary cannical above and down through the emphysic below. Physiphic fragment was driven in the mediculary cannical above and down through the emphysic below. Physiphic fragment was turned to secure additional fraction.

Lay 10 and 11 (Los 2) Margain withen six months after operation—though that preportions of bone has

They to and 31 (Case 4) Shirtain taken set montes such operation showing that regeneration of home has proximate frightly although there is no effort at mone between the old that frightly the first position of the proximal taken place from the tibit to the tempolant. The leg is solid and is growing in length.

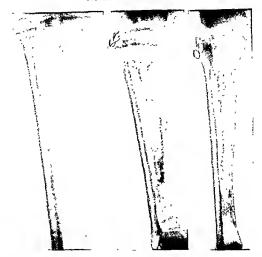
Estimation — The stagram andres posterior swee, shows slatintly that the folloaf fracture to oblique and that the fragments are separated for some distance. The tiles is broken sequer across and unon has apparently taken place with the production of some cellus. The laterals was shows that this union is only an apparent one and that there is considerable angulation of the fragments. The lower and of the upper fragment now shows a considerable callus formation. I has boy has not been

able to walk although he has attempted to put weight on this leg. The result is this deformity (Figs. 10-22)

Treatment — 11) pixal transplantation was done A longitudinal transion over the crest of the tibia about sight inches in length exposed both bones. The ends of the tibials fragments were only lightly covered by granulative tissue. The enish of the tibial fragment were covered by a considerable amount of callies and extartical tissue. There was no evidence.



Fig. 33 (Lise 6) Destruction of a considerable portion of the antierior portion of the inferior maxills by a gun shot would some of the shot can still be seen in the bose. This picture was taken with the clin of the patient resting on the plate, the light commit from above and in from Fig. 33 (Case 6). I small piece of the tibrs was removed, disboosed to fit the contour of the jan, and nailed in place with two carall sure tails. The normal curve of the jan has been restored.



I ig 34 (Case 7) Distruction of most of the shaft of the tibia by ostermyelitis. The epiphyses and articular surfaces of the bone were not affected.

Ing 35 (Case 7) Satisfram made three months after transplantation of a six inch fragment taken from the opposite tibus and contacted with specules of the bone remnants of the tibus with both above and below floor representations taking place. The head of the tibus it will be noted, his best transplanted, after temoval of its opposites into the side of the tibus it withinitian the length of the left.

Fig. 36 (Case 7). One year after operation, with almost complete regeneration of the shaft of the tibra. The small hole is or the upper extremity of this bone identifies the picture as being of the same leg as the other pictures of the screen.

of sepsis. The ends of both bones were carefully freed from the pew formed abrous tissue and fush ened until they bled. The tibual fragments were reamed out for a distance of about an unch and a half. The lower fibrilar fragment was reamed out for a distance of about half an inch. The upper fibrilar fragment was not reamed out because of its swall size.

The opposite tibia was then exposed at its middle portion for a distance of eight inches and two pieces of hone with the piriosteal covering were removed from its verst with classel and saw in the usual manner. One piece measured about four inches in length by 23 x 35 and the second piece about two inches in length by 14 x 34. The wound was then closed with deep catgut and superficial horsehair scatzes dusted with bismith suboilule powher and scaled with collodion. A plain storile dressing was applied. The bone fragments were carefully held with sequestrum forceps and not allowed to come in contact with anything.

The larger fragment or implant was then inserted



The problem of the transfer of the control of the c

into the titual fragments which had been previously resmed into the time of the transplant was used to the transplant was the transplant was the transplant was used to the titual transplant was the titual transplant with the titual transplant with the input fragment in such a manner that a heri literal contact of the mortial conformation of the high rays thus instored. Then mortial conformation of the high rays thus instored. There was no sign of deformation. It has usually a specific control of the high rays the present of the proposed for a specific control of the title of the title fragments and the present of the proposed for a specific steed out from the rows in the grown. Is soon as it was hardened it was out with a depleasa of the 2 st.

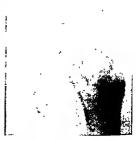
four works liter threast was removed to take out the stitches. There was faith from union of both tiling and tibult. The rest was respiled. Light weeks altor the operation the low was allowed to

texts the hospital

He returned sy months after the operation for the term of the best seems to be the term tured but the third appropriate to be frust until at the size of the third fraction. A wound operation was done. The should was form but the transplant in the tibut like the start of the total cash the differentiated from the tibut itself but its omparities. The fractive was unbinducible the night of too errly us of the limb. The upper and hower ends of the transplant hold tirmly until with the tibut.

A trough was checked out of the tibia above and below the fracture \$\foating\$ cm long and it em wade and deep. Into this trough was firmly letted a transplant taken from the opposite tibia in which the ident caused by the remarkal of the first two transplants had been tilted in complete to be new bone. Deep plan catgut and horselair skin sature closed the wound. However such subset of collision gaue and spaceant catholic gauge interestings were then applied. Due this a plaster of flans cost, catending from toes to the middle of the thigh, completed the trees in the cast was real asy our ground to cast wall be left on undisturbed for three meths of the zat.

Cast 5 - M J male, age 8. Came to hospital because of ununited fractures of tibia and fibula of kit he When the July was 7 months oil the mother while bothing him, noticed that the bit ke was lowed more than the right. She grew antivialout the deformits and consulted a doctor who stel the lower third of the tibir was fractured. The leg was put in wooden splints. The oplints were Lest on for tive morths. When the child was one sear old he begin to walk and a brace was put on the leg. When he was seventeen months of the was walking around without his brain and fell and at this time the I bula was fractifed. The leg #35 agam dressel with splints. The splints were temoved at the end of old werks but there was no hors unsin. The dischir advised laking the patient to a specialist, who put on a plaster cast and had the child up and around. The plaster cast trestment was kept up two years, the rast being changed at miera ils of six weeks. When the child was three and one half years old an open operation was performed and oluminum tules inserted in the modullars panals of the fraements of the tilia Three months after the operation, the hig was A rased and non union was still present. At this



lig 35 (Lass 8). I recture of an itemic neck of homerus, with disdocation of the head of the hone into the subrienced space.

time the parents brought the child to a New Vorlaspectible who put on a brace and athrest the Bier treatment by a rubber constituted above the knee twee dails one hour at a time. The brace and Bier treatment were kept up for a year authout result bade result. The plates were removed the expension of the plates were removed. The plates were wired by a surgeon in Copunhagen with the same result—non unon (figs 32-52).

Limitation — The loy is unable to use his kg at all because of lack of continuity of the this and fibula because of an old fracture, probably of about excen years' standing. There is no deformity when the kgs by ing flat on the table but there is a market sortening of the leg slightly over flow inches and the foot is considerably smaller than the killow, the result of disuve. The skingarm shows that there is a fracture of both hones of the kg with wide separation of the fragments. The cyphby as appear

to be intact

Treatment—An increase about eight inches in length was made on the anterior aspect of the leg over the eat of the fractures and the lones were exposed carefully. It was evident that a bone implant could be inserted into the tibus but that in the ease of the fibuls a lateral approximation or contacting would have to be made with thy upper.



Fig. 39 (Case 8) Skiagram taken shortly after the open and the shoulder are normal. The head of the humers is in the shoulder are normal. The head of the humers is in the glenoid cavity. The null secures it to the shaft. There is not much formation of new hone here. The very light shadows show that the rays passed through mostly dead home.



Fig. 40 (Case 8). This skitarram was taken allout three months after the operation and shows that a new head for the humerus is being built by the osteoblasts from the shaft of the bone, which passed into the Hastrian spaces in the head of the bone.

fragment but that an implantation could probably be made in the lower fragment

The opposite tibia was exposed and two pieces of bone were carefully removed from its crest. One piece measured live inches in length by 14 by 34. the other piece was four inches in hingth by \$8 by The tibial fragments were prepared for the im-The upper fragment was rramed out the medullary cavity being enlarged to receive the transplant but the fragment was so short, only half an inch above the epiphysis, that the transplant had to to be driven down into it as can be seen in the skingram The upper end of the transplant was driven up into the lower and of the upper fragment the case of the bulla, the upper fragment could not be reamed out breause of its small size the transplant was driven down through the epiphy sis of the lower fragment and a lateral contacting or approximation made with the upper fragment so that the transplant would serve as a splint for the fibula Approximation was secured with encircling loops of phosphor bronze wire, as is sein in the skiagram

The wounds in both legs were closed eardfully with chrome cagte in the deeper layers, and with horsehart to approximate the sim edges. The surface was disted with bismuth subsolide and the wounds sealed with collodion gauze. A giper cent carboke gauze derssing was then applied, over this a sterile gauze roller was wound and then plaster of Pariss casts were put on both legs, in the injuried leg extending well up on the thigh, in the unique leg extending well up on the thigh, in the unique leg was removed after two weeks and the stitches removed. After four weeks the cast was removed from the



lig 4t (Case 8) This skingram was made four months after the operation when the nad had to be removed. Bone regeneration is still taking place

left leg and the stitches removed. The cast has reapplied and was worn continuously for four months. After wax weeks it was evident that firm bony union was present. The boy could raise his foot for the first times ince the nigury occurred about seven years before this last operation (Figs. 28 and 20).

A skiagram taken six months after the operation shows that the condition is progressing rapidly

Firm bony union has taken place in both bones in the transplanted fragment but there is no effort at union between the old tibia fragments although they are in accurate approximation and the treen ctation of hone is proceeding satisfactorily. This case demonstrates that it is absolutely essential that there is contacting between the transplant and the bone, but that this need not necessarily be in the center of the bone, a lateral contact is sufficient. provided that it is securely maintained. The epiphyses are not injured by the driving of the transplant through them The leg is growing in length, although it will probably pever reach the same length as its fellow, because it was about four inches shorter at the time of operation (Figs 30 and 31)

DEFECT IN LOWER MAXILLA

CASE 6 — R. H., aged 27, about six months ago stained a severe injury of his chin by the discharge of a shorgun. The bone was shattered and sepos followed, which finally resulted in across and loss of the mental portion of the maxilla, His chin is flat and considerably marred by a badly retracted scar (Fig. 32).

Examination showed that there was no longer and evidence of sepsis. The wound had healed com-

pletely

Irealment — We planned to remove from the
patient's tibus a piece of bone of sufficient save to
fill in the defect in the mental portion of the infenor
manila after it had been shaped property. The
incision in the chin was made underneath the chin
along the margin of the manilla, curved in outline
and measuring about two inches in length. The



Fig. 42 (Case 9) Fracture of the neck of the humerus, with upward displacement of the shaft. The skiagram is misleading and would not aid materially in making a diagnosis of the fracture.

miscating (Geo. 6). In other was of the same shoulder, showing plandy both the fracture and the dislocation 17 4 (Geo. 6). Stagerin tisten shortly after the operation, showing that the fragments has been approximated in the normal position and fixed by means of a noil driven from the shoft into the head. The head of the noil was naived off and in his receded distribution the footness.

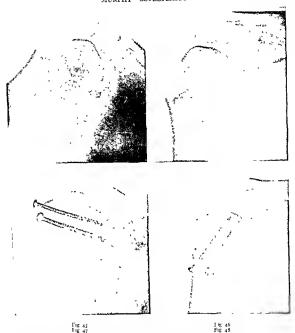


Fig. 45 (Case 10) The arm is shightly abducted. The fracture is evident, but the head appears to be in the glenoid cavity which physical examination shows was not

Fig. 46 (Case 10) Another view of the same shoulder, with the head appearing to be placed well in the glenoid cavity. In this case a diagnosis of a fragment being torn

out of the bone raight be made instead of a fracture of the

Figs 47 and 48 (Case 10) Two skiagrams taken about four weeks after the operation. The head of the bone is resting in the glound cavity. The two fragments which were fixed in position by two wire nails are apparently united.



Ing ap (tase 1). Old fricture of the nationic neck of the fenur, with absorption of the head of the bose. This skipgram was made four months after the operation he male are still in plue and there does not appear to be an absorption of the hone around them. The tracking the many the still a plue and the plue and the many the still a still a plue and the still a sti

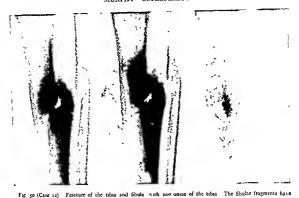
field was exposed easily and freely. There was perfect asepsis so that we felt that the hone graft or implant would five. The edges of the maxilla on either side of the defect were freshened, care being taken at all times not to injure the remaining alycolar parting of the 11w The edge of the right tibia was then exposed in the usual manner and a mece of bone about one inch and a half in length be), inch by 18 was removed. This was then shaped carefully to be me the defect in the jaw and to give the chin the normal convex outline This was easily done with chisel and bone cutting forceps implant was then laid in the bed prepared for it and approximation with the jan on either side was maintained by means of two small wire nails dreven from the edge of the implant backward into the ramps of the jaw, thus holding it securely in place The wound was then sutured in the deeper layers with catgut and the skin with horsebair Bismuth subtodide powiler and a collodium gauze dressing completed the primary dressing. This patient progressed very nucly until two months after the operation, when he hail an acute attack of appendicuts The appendix was removed Recovery was un-

Later he had his nose operated on, and for some reason sepsis occurred and he died about four months after the original operation on his chin. The last skaperam taken shows that the bone implant is in position and leads us to believe that the final outcome of the case would have been most satisfactory (Fig. 31).

OSTEOMY ELITIS OF TIBIA

CASE 7 — G. W., aged 6, almitted to Mery Horpital I shrauary 8, 1000. About nine months previous to her admission to the hospital the first time she suffered from an actic costemy, this with the solid control of the shall of the myor portion of the shall of the third that the solid control of the shall
Treatment - I irst operation, I chruaty 9, 1000. consisted in curettement unif removal of the spicule of bone, loosening the flaps from the margin and approximating them accurately for the entire length of the scar tissue that had been maile previously in the removal of the sequestrum. The periosteum for over a mehes of the middle of the bone had been destroyed entirely. The contraction of the muscles of the leg was producing luxation of the upper end of the fibula The upper end of the fibula was removed and a miche maile in the external surface of the tibis deep enough to admit the fibula to the shaft sale of the epiphy seal line so that the epiphysis of the tibia was to contribute to the growth of the tabula subsequently. The upper fibular emphysis was removed. The upper end of the fibula was wited in position in a cavity prepared for it in the healt of the tital and primary union occurred and a rapid bealing of all of the exavat ed and approximated zone in the tibia. The patient returned to the hospital April 26, 1909 The suppuration had ccased entirely and the wound was in good condition Second operation, April 28, 1909 In incision 61, inches long was made to the outer side of the old star line and the spiculæ of the remaining portion of both ends of the tibia exposed The periosteum was freed from the external anterior surface above and below. A triangular fragment of bone st, inches long by 18 by 1, by 58 inch was taken from the crest of the right tibin and trans planted into the cauty prepared for it where the shift of the left tibes had necrotized. The perios teum at the upper and lower ends was applied around the margins of the transplanted fragment and chromicized cateut encycled both bones to insure contimued apposition (Fig. 35).

Result - There was a primary union of the soft parts and a rapid the-term of the entire area occupied by the transplant. In three months she can be supported by the transplant of the term taken cleace months after the operation (Fig. 36) shows complete absorption of the transplant and the development of the bone to about the normal size of the this. The round opening in the upper cold of the pictures. So prefert is the reproduction that



reunited

Fig 51 (Case 12) Shingram made shortly after the operation, showing the transplant to the tibia and the formation of new bone around the fragments

Fig 52 (Case 12) Skiagram taken six weeks after the operation, showing the formation of a considerable quantity of new bone, so that the tibia appears to be solid. The transplant is still in evidence

one might doubt the shaagrams were it not for this opening. A picture of the gril taken April 1917, shows how completely a hone can regenerated the transplant is carefully contacted so that there is a perfect osseous fragment. It further shows that although the periosetum of the mapor portion of the shaft of the tibus had been enturely destroyed the hone reproduction nevertheless proceeded to the formation of a new shaft. Perfect functional and anatomic result (Fig. 37)

FRACTURE OF SURGICAL NECK OF HEMICALS WITH LUNATION OF HEAD AND NON-UNION

Cast 8 — Mrs. M. K. eged mreteen admitted to Mercy Hopptial Sprepher to , on 1 Jimes 20, 1911 patient was thrown from an automobile. Does not how how she landed nor whether she was uncon scours. She was 15100 on her right side, with her arm under her, and was assisted to her feet by being picked up under both strms, when she felt a pain in her right shoulder-joint which was increased on motion. She had shooting pains down the arm of the shear that the shear changed later to fracture of the neck. An X-ray petter taken a week, later was said to show nothing The arm was left in the original position for three weeks, when passive motion and massage were begun. She can now abduct the arm and has some deltoid motion, but cannot raise it with the elbow flexed.

Estimation — Shagram showed fracture of the neck of the humerus with displacement of the head out of the glenoid cavity into the subglenoid space. On examination it was found that she can abduct the arm four inches from the body and she has some deltiod motion but cannot raise it with the elbow flexed (Fig. 38)

Treatment — Under either annesibesia the shoulderjount was opened by an invision five inches long, parallel to and in the anterior portion of the delited The glenoid was lived from the remnants of the contract was the critical exposed. The head of the contract was the critical exposed. The head of the University of the critical exposed of the head of the University of the critical exposed. The head of the planted position and brought out on the table. The fractured end was freshened and it was prepared for replacement in the glenoid. The fractured edge of the humeral neck was then freshened so the cancillated tesser dearly showed. The head was then collect tesser dearly showed. The head was then collect tesser dearly showed the head. The fractured the collection of the collection of the collection of the staggram shows the bloodless head in position, and staggram shows the bloodless head in position, and



lig 5; (Case 13) Tracture of this and fibuls, with non-union of this after siting in 5; (Sase 13) Sustain male shorth; after the Tanylaination of a fragment of bone into the tilia ligs 5; and 5; (Case 13) Lateral and antero-posterior views taken as munits after the operation, showing complete restoration of the shaft of the tilis.

the second shagram shows the head fully regenerated. There was primary union and motion is rapidly returning. The joint is practically painless. Excellent result (Figs. 39. 40 and 41).

FRACTURE OF SURGICAL NECK OF HUMERUS

CASE Q — Miss L S aged to admitted to Merry Hospital Spepember 33 1010. Patant lift from a horse September 10 1010. Patant lift from a horse September 10 1010 on her left shoulder be got up and wolksled to the house. A doctor was called and by the time he came the shoulder was called and by the time he came the shoulder was rareful with the different shoulder was made to looking the injury the patient dol not mose the arm much but held it decad lyon her ablomen when the patient was moved it camed between the arm or shoulder was moved it camed between the time of the bounder was moved it camed her severe pun in the shoulder. The patient could move the arm forward and backward, but she could not abduct it.

Examination — This disclosed the physical disability already mentioned. The skingrum showed a fracture of the neck of the hungrus with upward displacement of the shaft of the bone (Figs. 42 and 43).

Trealment — An incision was made over the joint and the fractured bones exposed. The lower lrag ment overrode the upper fragment about one half inch, and it was necessary to remove about half of an inch before it could be reduced. The epithyses line was not disturbed. After bringing the bores in apposition they were secured by a half driven from the outer safe of the upper end of shaft through it care applied (Fig. 4).

Eastlet — Premary union of soft barts and bone.

Perlect functional result

UNIVERSE FRACTURE OF ANATOMIC NECK OF

Case to — II B, male, age 27, came to hospital on account of trability to use left shoulder joint. August 4, the patient was though his phylice when something went wong with the engine. He shut it off and solphanet to earth. He lended near a barb war fence and ran injectly into it. The machine was stopped to the force to the control force of the control of the struct a chicken coop and fell to the ground, landing on his left shoulder and pieces of the coop and gas tank were on top of him. He was unconscious for fifteen minutes. When he regained consciouses she had an arking pain over upper third.

of humerus; was mable to move the arm. No pain a shoulder. Few scratches about head and back and other minor superficial injuries. He was taken to a hospital where the surgeon diagnosed a back ward dislocation of the head of the humerus and a double fracture of the scapula. He was anæsthe tized and when he woke up the shoulder was firmly and tightly strapped with adheaves, so tight be could scarcely breathe. Over this was placed a wire screen cape. Arm was in a sing with elbow at right angles and forearm midway between pronation and supunation.

Three weeks later the adhesive was removed and the shoulder appeared to be normal. The doctor then strapped the scapula firmly with adhesave and the upper arm was held tight to thorax with adhe save, ellow and hand were free. Three weeks late a bone protruding just befind shoulder joint which was campined again and this time there was a bone protruding just befind shoulder joint who as diagnosed as a fracture of the accommun process and laceration of delitoid musels. Advised massage Canagot more shoulder joint in any interction which causing him great pain. Arm is held firmly to side of thorax. Tingling in hand off and on for a most process.

The skingram, although taken in seven different positions, did not in any of them indicate that the head was away from the glenoid articular surface, but a physical examination showed clearly that the head rested on the posterior surface of the glenoid cavity under the spine of the scapula. This shows how deceptive a skingram may be. At the opera tion the physical findings were confirmed.

Examination — The skingram showed that there was a fracture at the surgical neck of the humerus through the tuberosaties but did not show the subbarration of the head of the hone and rotation formard so that the shaft was behind the head. The upper end of the fractured shaft appeared to be covered by callous. There was no exidence of fracture elsewhere Motora effected considerable pain. There was little deformity merely a sight flattening of the shoulder and a little shortening of the upper arm. Seven and a little shortening of the upper arm. Seven the cast eleformity of this case and none about the cast eleformity as slid the physical examination. (Fig. as 3 and 6.)

Treatment - The shoulder joint was exposed by a longitudinal incision at the posterior margin of the deltoid, the fibers of the muscle being separated The head of the bone was free There had also been a longitudinal fracture through the head fragment making an inverted T (L) fracture of the upper extremity of the humerus The head was still alive. but was of abnormal size and conformation because of a malposition and bony union of the head frag Attempts at reduction failed absolutely Therefore, the smaller or outer of the two fragments was chiseled loose and reduction again attempted but without success. The large fragment was detached and then removed entirely. Its articulating surface was smooth and shiny With the fragment out on the table the fractured end was then freshened likewise the end of the shaft. The head fragment



1 ig 57 (Case 14) Antero-posterior view of sarcoma of upper extremity of tibia, not involving the joint

was then replaced in the glenoid cavit, and by means of firm fraction on and outward totation of the arm the two fragments were finally, approximated and maintained in postione by means of two wirt, nails driven through the shaft into the head. The arm was held in extreme abduction. Plain eating it sutures closed the deeper layers of the wound and horsehan was used to approximate the skin edges. No drain The structest assepsis was maintained throughout the entire operation.

A plaster of Brans cast was then applied extending over both shoulders, across the bark and chest with the injured arm in extreme abduction and ferred at the elbow so that the forearm was elevated to right angles. Both arms were fixed in this cruefficial position, the cast embracting the body in front and behind extending from the neck to the costal margin and fixing both arms resembling the fixiation cast that is applied to the hips after the reduction of a double congenitud dislocation.

The skiagram taken one month after the operation shows that union has taken place. The line of



Ing 38 (Cave 14) Another view of the same case also showing the location of the tumor. Here too there is evidence that the articular surface is not involved.

fracture is not apparent. The wire nails are still in situ. The final photo shows that the full conformation of the shoulder is restored (Figs. 47 and 48)

FRACTURE OF PELVIS AND NECK OF FEMUR Cast 11 - F H 5. age 40 March 20, 1011, was injured in a rulroad accident and was raken to the hospital where he remained for three weeks, but nothing was done except to keep him in bed. When he began to walk his right hip was very painful, and the right leg was shorter than the left. He was advised to use crutches and keep the right foot off the ground A Thomas hip splint was put on bur There was no pain no improvement followed except when stepping on the foot Can abduct and adduct, and has internal and external rotation and flexion, but is iinable to flex thigh on abdomen when the leg is extended, nor can he bear his weight on the leg because it gives way. He cannot abduct his thigh when the leg is deved. The leg is a cm shorter than the other

Examination showed a fracture of the pelvis and fracture of the neck of the femur with absorption of all the head, except a small piece (Fig. 49)

Treatment - In this case we exposed the hip joint in the usual manner and found that the head of the bone had been absorbed completely in the seven months which had elapsed since the injury. We removed three fifths of the trochanter with the figils saw, feating a pixel between the touch and anch in thickness to when the thought of were attached. This fragment was then maked were attached. The fragment was then maked, so as touch of the bone, which had been freshened, so as touch in the regeneration of a new head. The transport of the trochanter was also malled back in place with a wire mail. The leg was abducted and placed in a Tratous splint for eight weeks. Stutches removed, Primary union. Not allowed to use leg for four

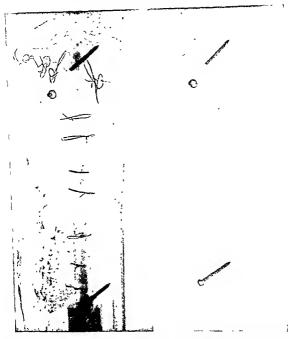
months September 30, 1012, the patient could extend, abulact, adduct and circumduct his leg. When seated he could cross it over the other leg by muscle action with the knee at right angles as so to pot the hip in extreme abduction. He was able to bear his weight on the leg and could walk without crutters, but was adduced not to do so for a while

FRACTURE OF TIBLA AND FIBLIA, NON-UNION CASET?—II P W, a man aged 32, was admitted to Mercy Hospital December 27, 1917 Family history was negative. Patient had been a civil engineer in the Canal Zone. He had tropical dysentery in roos, and malaria for past ten very.

Present treable—June 9, 1911, was in railway where and his tibia and fibials were crushed, resulting in a compound communited fracture with division of anterior tibial artery. A purulent discharge started on the third day and continued for fifteen



Fig. 50 (Case 14) The tumor split open after its remonal, showing how extensive the growth was, involving nearly all of the head of the bone except the articular surface and the outer portion of the epiphysis



Dig 60 (Case 14) Skugram made two months after the operation, while patient was still wairing a plaster cast, Bone regeneration is already taking place as is evidenced by the shadow along the right hand side of the transplant and persecut its displacement. The phosphos foronce the main slowe and below secure the fastion of the transplant and persecut its displacement. The phosphos foronce were stuties were used to approximate the deeper layers of the wound. The small foreign body to the left and below the upper and is not a part of the neuture.

the upper nail is not a part of the perture.

Fig. 61 (Case 1) This skrivarian was made about a year after the operation and shows to what an extent bone regeneration has taken place. The transplant is no longer in evidence. The new bone is ripidly taking on the size and thape of the old bone.



Fig 62 (Case 13) Fracture of the humanus about 234 inches above the elbow joint, with marked deformity and no effort at union, a typical pseudarthrosis

Temperature ranged from 100 6° to 102° for first three days Otherwise there was no constitutional disturbance. The leg was placed in a mold on the fifteenth day bkingram taken the next day showed an overriding of both bones with angulation of 45 degrees Vo extension was put on The mold was temot ed in four weeks There was slight motion at the site of the fracture Another mold was applied and left on for a month The patient walked on crutches six weeks after the accident When the second mold was removed the callus was a little more solid but there was still some motion at the fracture A plaster of Paris collar 12 inches wide was put on round the fracture and left on for three weeks During this time he used crutches The collar was removed . Mer two and one half months a second skiagram was taken (December 5) and showed an overriding of one and one half inches, with consider able mobility at the line of fracture This mobility had increased slightly up to the time of admission Fxamination - This showed a non union of the

Examination — This showed a not minor of the tibra I our skingrams of this case should how important it to have the pictures taken from various angles. One showed an apparently execution of the cond a fair union, the second a fair union, the third almost failure of union, and the fourth a complete separation of the two fragments by an interposed cartila.

ginous or fibrous mass. The fibula was united There was a slight external angulation at the site of fracture (Fig. 50).

Operation - An incision 4 inches long was made over the anterior surface of the tibia near its lateral margin The line of fracture was exposed A fibrocartilaginous mass was deposited between the ends of the bones, there was no effort at hone reproduction A groove one half inch wide and 3 inches long was chiseked through the anterior surface of the tibia down to the medulla, intercepting the fracture at its middle. The reamer was then used to free the medulla one half such above and 1 inch below the groove The tibia was then ready for the implant A transplant 41/2 inches by 3/2 by 1/2 by \$4 was removed from the crest of the opposite tibia with the chisel in the regular way. It was driven into the lower fragment until the upper end of the transplant could be depressed into the groove in the upper fragment and admit of the insertion of the upper end into the medulia. It was then driven upward into the medulia beyond the end of the groove, so that the transplant locked At the completion of this the leg felt strong enough to walk on it at that moment, so firmly did the transplant fix the end The penosteum was then closed over the graft with catgut and the skin closed with horsehair A plaster mold was applied extending from toe to 8 inches above

the knice Primary union resulted. The mold was remove dat the end of three weeks. The unplant had healed in nucely. The mold was reapplied, and removed at the end of fix e weeks when the skasgram aboved that a boay union had taken place. A leather mold was then substituted for the passes we sught on the limb and walk with returned to the end of the place
DNUMIED FRACTURE OF TIBLA AND FIBULA

CASE 13 — M S, aged 22 was admitted to Mercy
Hospital June 19, 1909 There was no record of

family history or personal history Present trouble - \ugust 26 1908, a laundry stove exploded and a piece of iron struck the right leg midway between the knee and ankle on the anterior surface. The patient became weak and dizzy and perspired but did not vomit. He tried to walk but was unable to do so because "his leg bent" at the point of injury He had no pain, only a numb feeling. He said that blood ran down his leg and that there were two holes on the inner side of his leg Then he had sharp shooting pains. He was taken to a hospital and operated on the following morning, double wiring of both ends was done. He thought that some muscle was united and a piece of bone removed His temperature rose to 100° F He had pain in leg on motion only The leg was put in a mold Patient remained in hospital until Nov 22, 1008 Six weeks after the accedent a very suc cessful skin grafting operation was done on the leg Patient said that there was no infection at any time He was in bed only fifteen days, and one month

before leaving hospital was walking on crutches the had a circular cast on all the time, from time of admission to hospital until now. Cast was removed every two weeks and new one apphed. He had pain in the leg for two or three days following the operation. In December wound reopened and patient went to bed. He was in bed twenty days, had no pain, but at night would get a numb sensation. He had hobbled around on crutches. Slight tenderness on pressure.

Instalment — Pattent was operated on June 15, 1000 There was no callus productron in this Approximation was good Effort at bone productron made from the perosteum around the wire and outward Ends of fibula had passed each other, the lower to the inner side of the upper Edges were freshered of both this all and fibular fragments, and approximation secured by the use of bronze wire

No union resulted (Fig. 53)

He was admitted to our service October 6, 1909. There was no ossification, slight callus production, apposition perfect. Bones were spread out, connective tissue removed from between them, and ends of bones, freshened with chisel and all cartilaginous

and fibrous tissue removed

It was planned to make an intramedullary transplantation from the left tibia. The left tibia was exposed and two holes were bored through and nails inserted in these to steady the bone for sawing 4 portion of bone was thus removed from the crest of the left tibia, measuring about 1/2 by 5/8 by 3/8 and about 3 mches long The medulfary cavity of both the upper and the lower fragment was reamed out and the transplant from the left tibia was driven into the lower end first, then the upper end was inserted and a nail placed into the implant transversely to keep it from being displaced on motion The wound was closed with catgut. No dram There was primary union in both the right and the left tibix. Shingrams were made repeatedly and showed the progress of ossification of the implant and of ossific union of the ends of the bone An elongation of the tendo achillis had to be made on account of the contraction that had taken place in the gastrocnemii during the long illness (Figs 54, 35 and 56)

rocnemu during the long illness (Figs 54, 55 and 56)

Result — Perfect recovery, with full restoration

of function

SARCOMA OF TIBLA

CASE 14 — N M a girl aged r4 was admitted to Mercy Hospital November 2 rgri Family history was negative Patient had the ordinary descases of childhood, no theumatism, no typhord, no scarlet fever, no diphthera. She had an attack of tonsilitis three years ago, good recovery, no complications

Present trouble — About three years ago she fell from a porch rading, a distance of about 5 feet, and injured her right leg just below the knee, but pand no attention to it. About three or four months later she noticed a slight pain at the same point when running or jumping. The pain was just below the right knee joint. Some weeks later pattent noticed that there was some swelling on the tribia



In 63 (Case 15) This skiagram was made about six weeks after the operation. The transplant is still visible Mthough the deformity was not entirely overcome, bone tegeneration is progressing very rapidly.

just below the knee, but took no treatment and continued with her school work. About a year and a half ago, or eighteen months after the original mjury, while playing she twisted her right leg. The parn following this was so severe that she was forced to lie down for several minutes before she got up and walked to the house From this time on the parn became more severe and swelling increased in the region of the head of the tibia just below the right knee One week after this injury a physician was called, who put the limb in a mold and instructed the patient to walk on crutches. She continued in this way for seven months, with very little complaint, except when she would put weight on ber leg About one year ago the mold was taken off and patient walked by aid of crutches and continued this



Fig 64 (Case 16) Fracture of the humerus in the upper third, with separation of a fragment

Fig 05 (Case 10) Skiagram taken about eight neeks after the operation, showing remarkably apaid regeneration of the bone. The transplant is visible, as also as the phosphor bronze wire suture which held the sequestrum in contact with the transplant.

to the time of admission. She said that during the past year her lep had been considerably swollen just below the knee. It had tenderness to pressure at this point, and she had pain when she put her weight on the leg, but none at all when she was at rest in bed. During the entire course of the trouble she had never had chills fever, nausea or vomiting General health had been good.

Examination — This showed a marked elliptical enlargement of the upper one fifth of the tuba, most marked on the unner side. It was hard, encapsulated and free from attachment to the skin. It extended over three fifths of the autron-unreasure, did not shall these did the three was no brust. Business choices and the state of the

ments, no metastases demonstrable The patient was very anemic (Figs 57 and 58).

Operation — Under either anzeithesis incusion was made on the inner said of the tuberosity of the tubs and extending down parallel to the tibul erest fora distance of y muches. A transverse incusion was made inward across the tuberosity of the tubia to strength of the tuberosity of the tubia to strength of the prosterior internal horder. Elevating the sin fing gave a good exposure of the tumor. It was clearly encapsulated and encroached deady on the puphys at its internal angle. All of its muscular attachments were freed, levang the periods certain and the tendanous portion of the muscles attached to the tibia. The tendo partille was divided one fourth inch from its tendo partille was divided one fourth inch from its



Fig 66 (Case 17) Fracture of the upper part of the shaft of the humerus with Lane plate securing fixation of the fragments There is splended apposition and alignment, but no union.

tubercle attachment. The tibia was divided transversely with the saw, 41/2 inches below the intercondyloid tubercle, and cut off above obliquely downward and outward, just below the cartilage, at the inner tuberosity, and ending three fourths inch below the cartilage at the external tuberosity and evulsed The joint was open. The joint capsule was now sutured to the margin of the cartilage over lapping its under side, so as to close the joint A piece of bone 1/2 by 3/4 by 3/4 inch and 5 inches long was removed from the crest of the opposite tibia This was accomplished with the chisel, mallet and saw, and is not difficult if the retractor is properly fixed to keep the soft parts out of the field and steady the chisel when the initial creases are made. The lower end of the transplant was inserted for one half inch into the medulia of the tibia and a nail placed transversely in it to retard its further entrance The upper end was placed in a depression one half inch deep in the remnant of the head of the external tuberosity of the tibia with another nail inserted transversely to retard its further depression The internal hamstring tendons were attached to the side of the transplant by an encirching suture and the end of the tendo patellæ was fixed to the anterior surface of the transplant in a similar way The wound was closed by a deep layer of catgut and the skin with horsehair Primary healing Leg placed in long mold from trochanter to toe (Fig. 50) Result - Patient was put to bed without exten-

sion The leg was kept in a mold. Examination on November 28 showed compiler primary union of the line of incision, with infiltration and apparent production of new callus around transplant, not the slightest evidence of infiammation. Leather mold applied. December 25, 1911. Examination March 10, 1912, showed the upper end of the tiba normain size. There were voluntary extensions and flexion of 10 per cent. The patella was perfectly movable. She could bear some weight on the leg but was not

size There were voluntary events on an earth of roper cent. The patella was perfectly movable Sbe could bear some weight on the leg but was not permitted to walk on it.

A letter from her physician, Dr. Ben. D. Baird, Galesburg, dated December 13, 1912, states that she has 70 degrees of motion and a fairly satisfact.

tory joint (Figs 60 and 61)

UNUNITED FRACTURE OF HUMERUS

CASE 15.— Male, G S aged 27, entered hospital
because of an ununited fracture of shaft of right

February 5, 1908, he was siding in the caboose of a fength train when a rear-end collision occurred. The car in which he was riding was completely demolished. He was rendered unconscious and remained so for fully three days. He received many injuries, all of which healed without modeln, except what he says was a compound fracture of the shaft whenevers. Two needs after the accident his arm was taken from the wire sphint in which it had been placed. The patient is not sure that the discharge had ceased, but knows that there was never much drainage. At this time the fragments



I ig 67 (Case 17) Skingram taken about six weeks after the implantation of a bone fragment. Regeneration had progressed to the degree that bony union was stated to have taken place

nere wired Six neeks later the bone was still ununited Wie was removed and he carried his arm m 2 cast. Three months after the accident he was operated on again. He thinks the callus was cut away and bone ends nere united with catgut. This was four years ago, and a false point of motion still remains at lower third of the right humers.

Examination disclosed a typical pseudathroosa On attempting to straighten the forearm by muscle action, the brachalis anticus and the flexors of the forearm pull the upper end of the lower fragment to right angles with the upper fragment. There is some fixation of the anticine ellowy point capsule. The skagram shows a fracture of the humerus with marked admittings above the ellow point with marked admittings above the ellow point at right angles to the upper. The fragment long at right angles to the upper. The fragment are furly at union. The ends of the fragments are furly regular in outline and appear to be covered with slight amount of callus (Fig. 6).

Treatment.- Longitudinal fricision on anterior surface of arm at outer margin of bicers muscles just outside the old scar of the former incision, which exposes the site of the fracture. A pseudocapsule had developed around the false joint. There was abrous union of the fragments The cap-ule was liberated from the fragments. The cartifugmous surface of the new joint was fairly well developed All of this new formul tissue was removed and the ends of the fragments freshened so that live bone would be contacting. The fragments were readily brought into apposition. The medullary canals of both fragments were enlarged with the reamer to a sufficient size and depth to receive the transplant which was taken from the creat of the patient's The arm was now covered with a sterde tilna towel

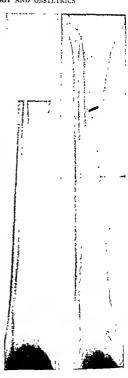
The crest of the till i was then exposed in the usual manner and a fragment of bone removed with saw and chisel measuring four inches in length by \$6 by

56 of an inch, wille and thick A small drill hole above and below marks the hingth of the implant. That guides the instrument in cutting the bone. The retractor guide guides the chief in cutting out the piece of bone and also keeps the soft tissues away from the chisel, so that they will not be injured. This retractor guide has two short prongs, one on either end These two prougs go into the drill-holes made in the tibia and hold all the tissues leach out of the field. We saw the bone crosswise at the point where the drill-holes are because that is where the fracture will be maile We take out a \ shapel piece of hone with a \. shaped carpenter's chi-cl all along the edge of the retractor and then the hime will fracture in that That deficiency in the tibia fills up reachly The implant is held with forceps and when removed is carefully placed in a piece of sterile gauze so that it will not be touched by hands or instruments and remain asentic

The incision in the leg is closed with ileep catgut sutures, the mustle being sutured on or the trough left in the tibia after the removal of the implant. The skin is sutured with borsehair. The wound is dusted with bismuth subioidine a desectating powder, and scaled with gauge saturated with collodion.

One end of the implant is now driven into the upper human siragement for a distance of two and one half inches and the other end is slid into the lower fragment for a distance of about an inch by making traction on the arm and thus straightening

Fig. 60 (Case 18). Skrigram faken about Iwo months after the operation. The upper end of the Irus-phant is fixed in the medullary canni of the tibrs with a mul. The lower end is embedded in a depression made in the internal malleolus. Bone regeneration is taking place. The frans night is affected of the former.



Lig 68 (Case 18) I viensive distriction of the that of the tibra by osteomyelius. Only a batton of bone remains of the internal malleulus and about four inches of the upper extremity. The ferror is in position and straight.

the lower fragment so that it will be in alignment with the upper fragment. The wounds now closed The deeper structures are united with chromatized catigut. The skin is closed with borsebari, dusted with bimmith subsolide and the wound sealed with colloiding nature. No drain, A giper cent phenol gauge directions of the colloiding nature of the colloiding nature and the colloiding nature and the colloiding nature and the colloiding nature of the colloiding nature and the colloiding nature of
Six neeks later the stirches were removed from and leg Primary union. The east has replaced and was worn two months more. When it was finally removed, firm union had taken place and the patient was encouraged to use his arm to a limited extent at first, gradually restoring it to full usefulness (Fig. 6a).

UNUNITED PRACTURE OF HUMERUS

Case 16 - Miss E J, aged 21, came to hospital because of an ununited fracture of humerus in its middle third

One month previously she had fallen and face tured the humerius. The arm was at once placed in splints and a few days later a plaster cast was applied. When the cast was removed three weeks later, it was found that union had failed to take place. The upper fragment had pieceed the bucyps place. The upper fragment had pieceed the bucyps skin. Fattent could not use her arm at all. The fracture was not compound.

include was not compounded, non-unon and the Examination of the control of the co

Treatment — Longitudinal meision along outer margin of biceps exposing site of fracture. The sequestrum was alive. The ends of the fragments were freshened and the medullary canal of each enlarged with the reamer.

A transplant measuring four inches in length by \$ 9 5 6 an mich was removed from the cress of the tibia in the usual manner and implanted into the upper fragment for a distance of an inch and at half and into the lower fragment for an meh. The sequestrum was utilized to serve as a lateral splint. The lower end of the upper fragment was encircled by a loop of phosphor bronze wire to secure immobilization of the transplant. Perfect alignment of all fragments was secured.

The wounds in the leg and arm were then closed with deep chromicized catgut and superficial horse-hair sutures, dusted with bismuth subiodide and scaled with collodion gauze. A 5 per cent phenol

gauze dressing was then applied. The arm was immobilized in a plaster of Paris cast extending over the shoulder to the root of the neck. The arm was fixed at right angles the hand resting on the front of the body. The stitches were removed in four weeks. Primary union. Cast replaced. After two months the cast was finally removed. Bour union with prict cuse of the arm. The patient was advised to carry the arm in a sing for my neck. The shargam showed that union between all the fragments had taken place and that the transplant was being gradually absorbed (Fig. 64).

UNUNITED FRACTURE OF HUMERUS

Case 17 — G W B, male, age 22, roundhouse man came to hospital because of an ununited fracture of right humerus

May 14, 1911 a turbine engine exploded and a preco filting metal struck his night arm about four inches below the shoulder and another piece struck he slow, cutting and bruising it, and fracturing the olecanon. The humerus was fractured. The wond in the elbow, was sutured and healed by first houston in the flow, was sutured and healed by first houston. The fracture of the humerus was compound to open operation was often and a four screw Lane plate applied. The wound was closed without drain, the arm dressed close to the side, flexed at the elbow but no cast applied. A sheet of heavy assession was used as a splint for the upper arm subsets on was used as a splint for the upper arm

The stitches were removed after two weeks and then pus began to exude from the upper angle of the wound. This continued for about a month The pus discharge ceased and the wound closed Never had chills or fever. No bone fragments extruded from the wound.

There is now some limitation of motion at the thow and non union of the humerus. The shargram shows the Lane plate still in place and the fragments in spherdad apposition and alagiment, but there is non-union. This is an example of what always happens when a compound irrature is writed, nailed or a Lane plate is applied. Suppuration occurred (Fig. 66)

Treatment — September 11, 1911, the fracture was exposed by a longutudinal incision. The thrif screw in the Lane plate was loose and there was considerable granulation ussue around the ends of the bone fragments. The remaining screws were fixed firmly and not suppurating. The plate was removed and the wound thoroughly curetted preparatory to doing the transplantation later when there would be no question about having a strile field for inserting the transplant.

A second operation was done December 12, 1011. Longitudinal incision over outer aspect of arm, and excision of all scar tissue. The bone fragments are readily expassed. The ends are covered with fibrous cicatrical tissue, making a fibrous and preventing bony union. The bone is still porous where one of the scream in the Lane plate was inserted. The lower fragment overlaps the upper about three fourths of



over the carpus. The radius is also fractured and a considerable portion of the shall is destroyed. The articular end of the bone is apparently in its normal relation with the carpus.

Fig 71 (Case 10) Stragam taken are weeks after the transplantation of a bone fragment into the radius. The ulns was shortened and the radius slightly lengthered. The phosphor bronze were sutures are holding the that fragments in apposition. The arm is now straight.



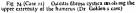
Fig. 72 (Case 20) Old unumted fracture of upper portion of shaft of fenur, with angulation, an overproduction of callus on the ends of fragments, but no effort at union Fig. 73 (Case 20) Skiagram taken three months after the operation, showing Lane plate securely in position and the leg fairly straight, with bony union of the fragments

an inch. We freshened the ends of both fragments removing all the fibrous tissue, and then enlarged the medullary canal in both fragments by means of the reamer so that the transplant, taken from patient's tiba. will be in contact with his bone everywher?

The implant measuring four inches in length by fix \$\frac{1}{2}\text{ ker} emoved in the usual manner from the crest of the thin with its periosteum and driven into the lower fragment for a distance of abouting the continues, and then by means of traction on the lower arm it was slid into the cavity prepared for it in the upper fragment, for a distance of almost an unit. The bounces was the prefer alignment per form the continues of the continu

The deeper tissues in the wound, the muscle sheaths and fascia, are approximated with chromi cized catgut and a few phosphor bronze wire sutures The skin wound is closed with horsehair, dusted with hismuth subsodide and sealed with collodion gauze A 5 per cent carbolic gauze dressing was next applied, and then a plaster of Paris cast ex tending downward from over the shoulder, the forearm being flexed at right angles with the hand The cast was cut with the Gigh saw on the chest as usual Stitches were removed after four weeks Primary healing of wound, no suppuration Union mute firm after 6 weeks and arm has grown steadily stronger When last heard from had splended use of arm (Fig 67)





Case 18 — Miss B, age 20, came to hospital on account of an old suppurative condition of the left tibia

October, 1908, she stepped off the perch and struck the inner side of her left ankle in the region of the internal malleolus on a cement block. She was conscious of the injury the moment it happened, but suffered no marked pain She walked six or eight blocks before she noticed that her foot was swelling rapidly She went into a doctor's office then and the foot and lower leg were swollen so badly that the doctor had to cut the shoe off Immediately the leg became very painful and she felt nauseated. She says there was a bruised mark on malleolus. The doctor applied some antiphlogistin and a tight bandage Then she could not bear her weight on the leg She was taken home and put to bed, where she remained two days On the third day she got up in a chair She did not have any chill and does not know whether she had any temperature. The pain and swelling became less severe, and after



Fig 75 (Case 21) Shingram taken about eight weeks after the operation showing rapid regeneration of bone along the transplant. The upper end of the transplant was satured into the capsule the muscle attachments being secured by means of phosphor bronne war enturies. Two wire nails fixed the transplant in the medullary canal of the humeus shoft.



Fig. 76 (Case 21) Photograph of the upper end of the bone. The acticular surface is not involved, although the internoe of the head had been penetrated by the disease. The external shell of the bone has broken out, showing the cavities produced by the disease.





Fig. 7. Lass of fracture of the anatomic need of the femul in a hoy 14 years of age, seen seen weeks after the injury. The fead is rotated and the ligamentations terrs was strangulated, so that the head was dead, but fortunately asoptie so that it rough be nailed to the upper end of the shall for the purpose of arding in the regioneration of a new head.

Fig. 75. This shargram was taken four years after the operation in Fig. 77. The raids which were used to manism the featition of the fragments are still in place. The new head has been regenerated completels and obser growth has not been unterfered with showing that the epiphus was functionating. Perfect motion has been restored in the hip and it is impossible to detect the joint operated on when the patient is walking or cereating the hip.

remaining quiet for two weeks she got a pair of crutches and started to school. She had to keep the leg flexed under the seat. As soon as she allowed at to hang straight down it began to pain

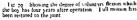
One week after starting to school (three weeks after injury) a circular plaster cast was applied extending from about six inches above the ankle to the toes The cast was very tight, and soon the toes began to swell and tingle Later they became numb and turned under She was unable to straight en them. The cast was not removed for six weeks and when it was taken off she felt something snap about the ankle and the foot herame suddenly inverted. She was unable to correct this. Two hours after the first cast was removed a second was but on with the foot in proper position. Toes were still flexed and numb In six weeks this cast was taken off and two hours later the foot was again inverted. It did not turn in with a snap as before but turned gradually in In June 1909, she discarded one of her crutches and walked on the outer side of this foot. She was even able to put her entire weight on the leg

She walked this way until November 1000 when she had a brace made to hold the foot that and exent then she could not put her weight on the foot. Had to use a cane or crutich. One morning in Max 1910 she notized that her cheeks were flushed. She did not feel well but went to echool. She kept getting a little worse all the time and about the middle of the afternoon she went home. She sat on the edge

of the hed to remote her shoes and as he leared forward she funted and fell to the floor 's along on as she was helped to hed, she had a chill and the following disy was ter nick with a high temperature. The foot become very painful and red and soon began to swell again 'a tike end of a wed to ten days the abscess which had formed opened upus below the internal malleolus and discharged a thick pus. 'A few days later a prece of bone appeared in the opening in the skin and it was removed. This discharge continued for four or five weeks. Then the wound closely.

In July 1910 she again walked on the outer side of the foot and continued doing so until November Then her ankle knee and hip joints became painful and swollen The knee and ankle were badly swollen but the hip was the most painful. This condition persisted for most of that winter and spring June 12 1911 she had another chill followed by fever She was in bed two weeks during which time she had excruciating attacks of pain in the back of the head and neck causing her neck to retract (opisthotonos position) and she would be unconscrous tor a short time (two minutes) She was taken to the hospital June 20, an opening was made over the middle of tibia and pus and necrotic bone were found The shell of bone crumbled when the attempt was made to chisel it free and a large pocket of pus was found in the medullary cavity This pocket was drained After this operation she got a pain in the hip joint that was relieved with the







In 80 When the box is standing erret with both feet on the ground breks together both hips are on the same level apparently although the operated leg is about a half an inch shorter than its fellow

use of Buck's extension. In August the ankle and knee became swollen and painful. The tihir near those joints was opened and drained. This relieved the pain and swelling lebruary 1912 most of the tibia from two or three inches below the upper epiphysis down to the lower was removed 1 week later she got a severe enrache and the following day went into a stupor which lasted three or four days Suddenly a purulent discharge poured from her nose and she regained consciousness. Had a tem perature of 10201 at that time She remained in the hospital three months than went home with a plaster cast on her leg extending from six inches above the knee to the toes This she wore until August 1912 Since then she has been mearing a heavy canvas cast. Has been walking with crutches since she left the hospital. She had one discharging sinus below the aukle that dramed until about two nicks ago

Examination showed absence of most of the tubal About four inches of the upper end was affact. But and to the fragment was conteal in shape. At the closer cent their apparate to be only. A vers with piece of tuba remaining not more than three fourths of an inch in length. The flower epiphysis was gone. There was no discharging surus but there was a wound about the size of a sixty dollar just below the internal malleolus. The flubble was most and in proper relation with the tibal above and the nakle below. The patient could not be at her weight on this leg (Fig. 68).

Treatment — An incision about fourteen inches long was made over the tibia and exposed the tibial remnants above and below. There was no evidence of suppuration anywhere.

ments were freshened and prepared for the transplant by colleging the medullary canal in the upper fragment with the reamer for a distance of an inchand a half. Owing to the small size of the lower fragment a carty only one inch deep was made. The gap between the two fragments measured eight inches.

The crest of the opposite tilia was exposed in the usual manner and a piece of bone ten inches tong by 1, by 26 of an inch with its periosteum was carefully removed with chisel and saw and placed in the bid prepared for it in the other leg. The upper end of the transplant was driven into the upper tibul fragment for a distance of an inch and a The lower end was inserted in the cavity prepared for it in the small lower fragment. A small were nail was driven through the upper fragment and the transplant so as to immobilize the latter The muscle opponens was approximated with chromicized catgut and the skin wound was closed with horsehair dusteil with bismuth subjedide. sealed with collodion gauze and dressed with 5 pcr cent carbolic gauze. A plaster of l'aris cast was applied extending from the groin to the toes The wound in the other tibia was closed in the same manner except for the cast. Four weeks later the stitches were removed from the leg, from which the transplant was removed Primary union Condition of patient splendid. The cast will not be removed from the operated leg for eight more weeks This is the longest transplant we have ever used The skiagram made one month after the operation shows that the transplant is in place and everything looks favorable for a successful outcome of the case (Fig 6n)

UNUNITED FRACTURE OF RADIUS WITH DEFORMITY

CASE 19 - Mrs E S, 54 years of age, came to hospital on account of disability and deformity following compound fracture of forcarm

December 21, 1917, while come domastians, patient irruped and fell forward lindling on a cement floor at the bottom. She does not know how she landed but to bough elped to her feet she noticed that her virst was bleeding and that she had lost control of her hand. She could neither flex nor extend it. She at once consulted a doctor who put on a temporary dressing and sent her to the hospital lite recommended operative intervention, which she relieved. There was a communicate compound fracture of the radius just above the epiphysis and a simple extruse of the hand solve the open from its order form its anticeptive and the fracture reduced. The arm was immobilized with a siblet.

The following day the patient complained of chilly sensations and the temperature rose to 102° F. The arm became swollen and red, the axillary glands enlarged. On the fifth or sreth day, the wound at the wrist began to discharge pus, and a few days later,

pieces of bone were discharged. This discharge nersisted for about two months.

persisted for about two means. The patient was then anarsthelured and an open operation itom: The ends of the radial framents were freshered and a Lane plate applied, although deep down in the world and the patients of the world to keep the patients of the world then healed and the deformity, now present soon manifested used! The deformity now present soon manifested used! The deformity now present soon manifested used! The deformity now present soon manifested used! The world world about the patients of
Examination disclosed a healed fracture of the ulna with sublivation of the head martd and downward so that it shill down over the carpus. The radius was fractured with destruction of the shaft causing a sbortening of three fourths of an inch

(Fig 70)

Treatment - The ulna was exposed at the seat of the old fracture by a longitudinal incision four inches in length on the external surface of the arm The bone was divided with a Gigli saw and chisel on the plan of a tendoplasty when doing an elongation of a tendon One half the circumference of the bone was removed for a distance of three fourths of The end of the upper fragment was an inch beveled so as to permit of a literal approximation of the upper and loner fragments This approximation was maintained by means of two phosphor bronze nare loops which encircled the ulna procedure shortened the forearm three fourths of an inch, compensating for the shortening of the radius

The lower end of the railius was then exposed by a four inch longitudinal incision on the anterior aspect of the arm. The old scar tissue was exceed, as well as a mass of firm fibrious tissue which was interposed between the ends of the raddil fragments. The fragments were then exposed freely and fresheard. The medullary canal in both fragments was enlarged with the returner and a 2½ inch framsplant with its periodicum, removed from the creek of the patient's tibin in the usual manner, was uncried so as to secure continuity of bony tiping the security of the wrist nas in large was the normal nantomy of the wrist nas in large and radius. The bone translation was not freed with either and section of the patients when the results are the results of the section of the secti

The deeper layers of the wound were closed with plain ratigut and the skin with horschair. The wound was dusted with subloided of hismuth powder and sealed with collection gauze. A spercent carbolic gauze dressing was then applied and over this a plaster of Parse east, extending from the finger-tips to the elbow, the wisst joint being midway between Sexion and extension. The cast was cut with the Gub saw

and extension | 1 De cast W

Four neeks after the operation, all the stitches are removed. The wound had healed by primary union and the forearm was firm. Ossific union was progressing rapidly in opite of the patient's advanced age. There was absolutely no limitation of motion in the wrist or fingers. Pronation and supination were prefect (Fig. 71).

LAUNITED FRACTURE OF FEMUR

Case 20 - C H D, male, age 38, came to hospital on account of non union of fracture of upper third of right femur (Fig. 72)

December 9 1910 he was thrown from a buggy a distance of about six feet fanding on his feet first, then sat down On attempting to rise he found that his right leg would not support his weight. He was earned to a store near by. The pain in the thigh was so severe that he was given morphin lie was taken home and within an hour from the time of accident be was anæsthetized and the leg put in a plaster cast that extended from the foot to waist Doctor told him he had a fracture of upper part of femur and another in the lower articular region of femur at knee joint. Four days after cast has put on, a Buck's extension was put on The adhesives were But on the outside of the east Cast and extension remained on for six necks. When the cast was removed, patient noticed that there was a deformity at site of upper fracture. The knee was swollen and painful and especially so when they attempted to move it. He remained in bed two weeks after cast was removed (eight neels in all) and then begao using crutches, which he is still using His knee was sore for two or three months but then got entirely well Flexion is somewhat limited tension is perfect. When standing erect, the leg at first was about 112 inches shorter than the other Thinks it has gotten some shorter since that time. Only a few weeks since he has tried to put weight on that side The thigh is very weak and has a

Never had any temperature that be little pain knows about.

Examination - There was a marked outward bowing of the right femur at its upper third with failure of union Was unable to bear any weight on leg. Skiagram showed simple fracture with ends of fragment covered by considerable callus formation, but no effort at union The fragments were displaced outward to form an angle of 45 degrees

Treatment - A longitudinal incision on outer aspect of femur extending down to vastus externus muscle separated and fragments readily exposed. The fragments were freed with scalpel and chisel There was a typical pseudankylosis The end of each fragment was sawed off, removing all callus, so as to permit of good approximation. A fragment of bone, measuring 21/2 inches long and 1/2 inch wide and thick was sawn off of one of the pieces removed from the end of one of the fragments and was in serted into the cavities which had previously been made with the reamer in each fragment. A sail was then driven through the transplant between the ends of the fragments to prevent its slipping up or down

A six screw vanadium steel Lane bone plate was then applied to the femur on its external surface Thus approximation of the fragments was secured and the transplant will allow bony umon to take place (Fig 73)

The wound was then closed with phosphor bronze wire sutures approximating the aponeurosis, deep plain catgut sutures and horsehair skin sutures. The wound was dusted with bismuth subjodide, scaled with collodion gauze and dressed with s per cent phenol gauze A plaster of Paris cast was then applied, extending from the waist to the toes

CASE 21 - R C, 13 years old, entered Mercy Hospital because of lameness and tenderness of right upper arm. His family history is negative He was always free from digestive disorders of all kinds, never had rickets, scarlet fever, rheumatism. tonsilitis, or sore throat. He always was a strong, active boy, with full use of both arms, and both arms and shoulders were of the same conformation

Early in 1011 while throwing a ball very hard he experienced a sudden pain in the right arm four inches below the shoulder On attempting to raise the arm he found that he could not do so, it hune limply by his side A doctor told him that it was broken, and placed the arm in a splint for six weeks Umon was apparently perfect, and he gradually regained full use of the arm

In March, 1911, he fell on a starway, striking on his right arm and breaking it. He carried the arm in a splint for six weeks, and again it became perfectly useful, but for four or five days only He fell to the floor, striking on his left shoulder, but the right arm broke (third fracture) There was little pain connected with the injury The arm became useful again, though it remained a little lame

In July, 1911, he attempted to sit down on the floor and felt bis arm and hand were limp. He had no pain The arm was not fractured, but on exammation he noticed for the first time that the arm was larger at point of fracture and uneven fractures had occurred at the same point again became useful. Four weeks ago arm was lame and he could not raise it from body, and a tenderness has been present at site of fracture since that time. Wassermann negative Leucocytes, 8200 Hæmoglobin, So per cent Urine alkaline, but otherwise normal

Examination - Considerable tenderness over upper end of humerus, mability to raise arm, some enlargement and increased resistance on palpation. Skiagram shows fusiform enlargement of upper end of humerus, not involving the articular surface of the head of the bone It was a typical case of

osteitis fibrosa cystica (Fig. 74)

Treatment - Operation by Dr John F. Golden, Incision was made directly over point of right shoulder on its outer and slightly on its anterior aspect This divided the deltoid longitudinally and passed down to the bone, the shaft of the humerus, for fully six inches At the upper angle of the incision the capsule of the joint was exposed, and at the lower angle could be seen the musculospiral nerve This nerve was tested with the excitor both before and at the completion of the operation and found to be uninjured

At a point 53/ inches below the head of humerus the shaft showed absolutely no signs of involvement. Here the bone was freed of all its attachments, retracting the musculospiral nerve. A chain-saw was placed about the humerus at this point and the bone

nas divided

The capsule of the joint was now divided circularly at its attachment to the neck of the humerus The muscular attachments about the head were freed, keeping very close to the bone and even removing a small amount of it at the greater and lesser tuberosities The outer head of the biceps was lifted from its place in the bicipital groove and displaced inward It was not cut

Now the upper end of the humerus was plainly visible This portion was fully 534 inches in length and triangular in form, with broad end at upper end The largest diameter was 21/2 inches. The mass was globular, expansible, and cystic, with eggshell-like portions of bone in places, and brittle. In other places it was more fibrous and less fragile. The periosteum had previously been removed when the muscfes were taken off Periosteum was carefully examined and found to be free from involvement in the process Beginning at the inner side, the periosteum was elevated and the mass rolled outward and upward, detaching the periosteum from it until it was completely freed Great care was used lest the musculospiral nerve be endangered in this process The head of the humerus was not involved in the process, and the articular surface was apparently perfectly normal (Fig. 76)

In considering the operation, the first question that presents itself is, in what class of cases should we advise the operation. Undoubtedly the first are cases of darryncystitis with repeated abscesses cases the cicutricial obliteration of the canal is so great that other methods of treatment are impossible. The next are cases in which, although the lachrymal abscess has not been repeated, there is a lachry mal fistula through which tears drain away with resulting occlusion of the lachrymal drainage canal, and there is a third condition, in which although the catastrophe of lachrymal absees has not yet supervened and although the flind can be forced through the canal into the nares if the lachrymal syringe is used with considerable force, the retention in the sac is so obstinate that the sac cither cannot be emptied at all with digital compression or only occasionally. The fact that a low grade of infection may remain if the condition persists, and that the infection may be regurgitated into the conjunctival sac makes these cases a menace to the eye itself and this is particularly true when operations are done which require the opening of the globe of the eye more especially in operations for cataract. A very considerable portion of all cases of infection of the corneal wound in cataract operations is due to an unsuspected source of infection in the lachrymal drainage apparatus, and when it is known that such an infection exists the radical operation for the extirpation of the sac is the height of conservatism

In pulhe clinics where the long continued attendance of the pattent is difficult to obtain, treatment is almost always omutted before the case is completed. Many patients who are unstilling, either on account of their work or the distance of the clinic from their home, to give the necessary time for treatment, are utiling to authorities and the distance of the clinic from their home, to give the necessary time for treatment, are utiling to authorities of a week or two There are also occupations, such as those of the stone mason, the machinist, and others, in which repeated inputies of the epithelium for the cornex are likely to afford opportunities for the entrance of micro-organisms. When the patient in such cases is unwilling to sub-

mit to treatment for any considerable length of time, he should be advised to have the sac extirpated

Major Elliot of the East Indian Medical Service has urged that in cases of septic lacer of the cornea due to infection from the lachrymal sac, immediate excision of the see has a favorable influence upon the comed condition, and insists that in such cases the sense of temored. There are certain other conditions of the lachrymal sac, such as those cases in which a persistent trachoma is maintained by the trachomateous condution continuing its course in the lachrymal sac, where operation for extiguation is entirely mastibed.

The principal difficulty of the operation is due to the fact that, after the long continued inflammatory process, the tissues have become so changed in their macroscopie appearance that the walls of the sac are not easily differentiated from the surrounding tissues. with the result that fragments of the pusproducing mucous membrane are left behind and are a source of new pockets of pus in the same locality. In order to obviate this difficulty a number of expedients have been devised all having the purpose of distending the sac in such a manner that its outline can be easily recognized. Holmes suggested the injection by means of the lachrymal syringe, through the slit canaliculi, of a thick starch in warm solution which had been colored with iodine, and that the entrance to the sac be then closed with hamostatic forceps. Such a method, to be efficient requires, of course, that the outlet into the nose should be closed Others, such as Meller have suggested in a similar manner the injection of melted paraffin having a melting point of 110° to 120°, and then the application of cold compresses to harden the mass. One of the objections to this method is that if there happens to be unsuspected openings through the walls of the sac into the neighboring tissue, the warm paraffin is poured out into there tissues and remains permanently. As it is practically non absorbable, accidents of this sort are annoying

Others have suggested that paraffin of much higher melting point should be used and injected cold by means of a powerful syringe, thus forcing in a stream of small cylindrical fragments. Skeel is credited by Weeks with a suggestion to pack the sac with sterile cotton wool, either through the slit canaliculi, or through an opening made into the sac for that purpose Ohlstrom and others have constructed and introduced instruments into the sac with the object of defining its outline during the operation. The tendency of the day, however, appears to to tideligent, methodical, anatomical dissection for guidance in outlining the sac

Most operators in this country operate under a general anæsthesia, but in Europe there is an increasing number of men who operate under local infiltration anæsthesia, using for the purpose a mixture of cocaine and adrenalin, hoping thereby not only to get sufficient anæsthesia to enable them to operate, but also to control the very annoying hæmorrhage which so often accompanies this operation Meller, who strongly advocates this method, uses a solution which contains 8 to 9 parts of a 1 per cent solution of muriate of cocaine and 1 to 2 parts of 1-1000 solution of adrenalin chlor One cc of this is injected subcutaneously by means of Pravatz' syringe in several punctures. The first is 1.5 mm below and slightly to the temporal side of the inner canthus At this point a few drops of the solution are injected, then the syringe is pushed in a few mm farther toward the sac, keeping just beneath the skin, a drop or two more injected, and this continued until the needle has passed over and beyond the internal canthal ligament The second puncture is placed between the upper part of the lachrymal sac and the cupola of the sac on the median side rust above the inner canthal ligament, and a few drops of the solution injected, and by a third puncture this process is repeated just below the canthal ligament The area is then gently massaged In elderly patients with advanced arteriosclerosis not more than 1 should be injected, and this is generally sufficient in these cases

The usual antiseptic precautions should precede operation, of special procedures one of the best is,

perhaps, putting outment of bichloride of mercury into the conjunctival sac and smearing it over the lids and the region to be operated on the night before operation, and covering the eye with a pad and bandage. Holmes recommends that before operation a strip of gauze should be packed up under the inferior turbinate over the exit of the canal, to prevent blood from entering the pharyns. If the conjunctival sac contains purulent maternal, it should be empired by pressure, the pus caught and removed on antiseptic swabs, and the face again washed with an antiseptic. Following this it is wise to again flush the sac with an antiseptic sofution.

The first step in the incision should be the definition of the internal palpebral ligament by drawing the hds out nard, and then defining the line of incision by following with the finger from the lower border of the orbit the ridge extending along the outer edge of the lachrymal groove up to the ligament The incision begins just below the ligament and is continued crescentically first downward and then outward, following the crest of the ridge incision should be from 11/2 to 21/2 cm in length Elliott states that the average incision in 310 cases was 20 mm, the maximum being 27 mm meision should be made boldly down through the subcutaneous tissue to the anterior lip of the tachrymal groove, avoiding if possible the twig of the facial artery from which an annoying hæmorrhage may result. In making the incision the point of the knife should be directed somewhat obliquely toward the median line Meller's or Axenfeld's retractor should then be inserted. The next step is an incision through the aponeurosis. which should be carefully done to avoid cutting the walls of the sac that he directly beneath This is safest perhaps, when done upon a director incision should follow very closely the bony outline.

Many operators do not feel that it is necessary to avoid the palpebral bigament, and the operation is much more difficult when this structure is left uncut If the operator decides to sever the ligament, at the conclusion of the operation one or two stitches must be carefully placed to unite the cut edges When this is done in a majority of cases no harm results from this method of operative procedure. The incision completed, the sac is lifted up from its bed in the lachrymal groove by blunt dissection commencing on the nasal side and following the bony wall closely When well loosened, it can be held forward with a large strabismus hook, and the dissection then proceeds upward until the apex of the sac is reached. It is usually necessary to cut along the outer edge of the lachrymal groove with scissors or a bistoury This dissection should be made very close to the walls of the sac, to avoid danger of making an opening into the orbital cavity, which may be dangerous at times from a resulting orbital abscess When this has been carefully done the bulk of the sac is lifted up throughout its entire portion, the apex of the sac seized with forceps and dragged It was a question whether or not to remove this head. It finally was decided to remove it

A transplant seven inches in length was now removed from the right this and ends rounded into shape. A hole was drilled in each end of this strip, the lower hole being about 1½ mothes from the end. A hole was also drilled in the medulla of the shaft of the humerus, and the transplant inserted into this hole a distance of 1½ in their. A nail was placed transversely through transplant inserted into this hole a distance of 1½ in their. A nail was placed transversely through transplant and humerus, thus preventing the transplant and humerus, thus preventing the transplant and humerus, thus preventing the transplant and humerus, thus a purse-training, the capall. One a capatisative as a purse-training, the capall of the transplant, which reated in the glacend cavity. Now two ware squires were passed through a hole in the upper end of the transplant and also through the point capsule, Muscular attachments were not included in the The wires were tited about the capsule only as an additional means of keeping the triansplant in position in the glenoid fossa. The old periostem of the humerus was sutured around the transplant. This curried the miscular attachments, none of which had been apparated from it. A row of sutures closed had been apparated from it. A row of sutures closed of horochist closed the skin inchison. A plant course of horochist closed the skin inchison. A plant course was applied, covering the arm from the side of the mark to the works, with arm at right angles (Fig. 75).

Result — Six months after operation: Patient made perfect recovery and has now full function of aim and a movable shoulder joint. The improvement is very satisfactory. The regeneration of the upper end of the humerus is progressing well, proceeding upward from the shaft of the home

EXTIRPATION OF THE LACHRYMAL SAC

By MYLES STANDISH, M. D., Boston Williams Professor of Ophthalmology, Harvard Medical School

THE treatment of disturbances of the lachrymal drainage apparatus by the mechanical reopening of the canal has been pursued for many generations, and it is not long since this method was all but universal. I remember well when the surgeon at the Massachusetts Charitable Eye and Ear Infirmary, on entering the clinic, would pack up his apron and laconically remark "Probes first, please," and then there would be marshaled ten or twelve cases, who would soon be seated on a back row of seast with silver horns of assorted sizes projecting above their evelows-

The treatment by probes gave many disappointments, and there were many dificulties attending it, the first being due to the fact that patients were unable or unwilling to give the long amount of time required for the dilatation of the canal, and second, the mechanical dangers of the procedure itself, for take passages were far from unknown; therefore, this line of treatment m many cases failed when most skillfully and conscientiously pursued. The alternative to this method was practically continuous probing method was practically continuous probing

by the introduction of styles, and this naturally led to the use of hollow styles or cannular to make a semi-permanent lining of the opening produced by the probes. These latter methods failed and were abandoned largely on account of the difficulty in maintaining cleanly conditions, and accidents which resulted from the enlargement of the passage and the failing of the cannula through into the nasal cavity, from which it was extracted only with considerable difficulty.

The need of better methods led to minor changes in the procedure, the first being the introduction of much larger probes, such as those of Theobald, which not infrequently created an opening sufficiently large to remain permanently patent Suggestions have also been made of an artificial opening from the lachrymal sac directly into the nasal cavity. This procedure, however, has never obtained any great popularity.

The annoyances and lack of success of these various methods convinced the ophthalmological profession that there was need of more radical methods of procedure, and this found its expression in proposals to extirpate

the lachrymal sac. While this method has grown in popularity but loowly in English speaking countries, in continental Europe it has heen accepted with considerable enthusiasm, and there are certain clinics, I am told, where practically all cases of epiphora are operated upon in this manner

The clinical history of the disturbance of the sac and lachrymal canal is somewhat as follows. It is first noticed by the patient that the tears overflow easily from any irritation, such as that caused by a cold hreeze, smoke, or any emotional disturbance of a slight character. This, of course, is due to the fact that the narrowing of the lachrymal duct through the catarrhal condition makes it insufficient to care for more than the normal flow of tears As this condition proceeds, the epiphora hecomes more constant and the tears filter through from the sac only slowly and with difficulty, then mucus and epithelial detritus from the conjunctival surfaces are retained in the sac as the water filters through, the sac becomes distended, and is filled with this material. This naturally forms an ideal culture medium, and there are washed down from the conjunctiva pyrogenic organisms which become implanted upon this material; these multiply rapidly, and then comes the condition spoken of as dacryocystitis, or lachrymal abscess, the swelling and pain from which are very considerable; and eventually the abscess, if allowed to follow its own course, points upon the surface near the lower inner margin of the orbit, empties itself, closes, and upon favorable conditions again arising, repeats Eventually fistulæ may be established, discharging a mucupurulent material, and the adjoining tissues become involved, extending even to the bony walls themselves

Now to the conservative surgeon it is evident that, because this pathological procession of events has started, it is not absolutely necessary that it should continue to the last stage as described Indeed, in the early stages of this process, unless the exciting cause is actual bony deformity at the masal end of the canal, a vast majority of cases can be cured without any operative procedure whatever. It is necessary only to treat the linking membrane of the drainage

apparatus with antiseptics persistently and consistently over a period of months, and even years, to effect a practical cure. The best applications are those which are active in inhibiting the growth of such micro-organisms as are usually found in the conjunctival sac. The two which are most naturally suggested are sulphate of zinc and bichloride of mersulphate of zinc and bichloride of mer-

Many others are of value under various modifications of the condition and are easily suggested to the mind of the competent ophthalmologist But in order that they should be of value, it is necessary that they should reach the mucous surfaces of the sac and canal This is often attempted by the surgeon's dilating the canaliculus and injecting the necessary solution with the lachrymal syringe This is a method highly efficient, but it cannot be repeated sufficiently frequently by the surgeon to derive all the benefit which is possible from the applications. Therefore, the patient himself must make the applications by putting drops into the conjunctival sac, and making sure that the lachrymal sac is first emptied. This is most easily accomplished by teaching the patient how to compress the sac and force the contents into the nose, and not back into the conjunctival sac. If this is done just preceding the dropping of the collyrium into the eye, and the canaliculi and punctæ are still efficient, the fluid is immediately pumped into the drainage apparatus, and a very efficient application is made by this method, and if an occasional gentle, not too wide dilatation of any narrowed passage of the canaliculi or canal is made under antiseptic precautions, most such cases recover. But when this much to be desired result is not obtained, and it is evident that something more radical should be done, the trend of the opinion of today is that the sac should be extirpated. That the extirpation of the sac means a radical cure has long been known, and many attempts have heen made to destroy the sac with caustics and cauterization with occasional success, but there have been many disappointments due to the difficulty of making successful applications of these agents in the upper portion of the sac.

down, and the canalicule cut; then the sac, being freed, is dragged upward as Ia as may be, and cut off below as deeply in the bony canal as possible. The lachymal lossa is then carefully searched, and if any portions of the sac, granulating tissue, etc., remain, they are removed. Hollens advises splitting the canalhouli their entire length. If there are fistels much that the this stage of the procedure the sac should be splitt open and examined under water to make sure no part is left behind.

When the ligament has been left, it is often difficult to remove the tip of the sac, which is placed somewhat deeply behind it. In such cases, it has been recommended that a hall shaped cautery should be used to destroy that portion of the sac

which might possibly be left.

When the preceding inflammation is of long standing, and the fistular have matted all the tissues together, it is often difficult or impossible to recognize the sac. In such cases one should cut down on the anterior crest of the lachrymal groose, separate up the tissues on that side, and with book or elevator seize the tissues and excise the sac with its surrounding walls without too much attempt to make out anatomical details Keep always as close as possible to the lachrymal groose. In the ordinary case, after hamorrhige has been stopped, if the wound does not look clean, remnants of the see probably remain. If at this stage of the opera tion it is determined that there is marked necrosis of the nasal bone, possibly the best expedient is to remove all diseased bone, making an opening into the nose in the region of the middle meatus.

After the sac has been removed, cocaine should be dropped into the wound and introduced into the We should then pass large probes, from No o to No 12 Theobald, and the walls of the canal sould be thoroughly cureifed This is generally middet to produce good drainage, but Elliot recommends, in soroe cases at least, that a red hot syndle-shaped cautery should be thrust boldly down the duct to insure the destruction of its liming centrate After all bleeding has ceased, the wound shed be closed with a subcutaneous horsehair gire, in which case, if suppuration does not result, path sis not to be expected if the integument is not ided, the resulting scar is insignificant and the modul appearance is much superior to that by cautenzation of the sac or by its of the patural processes, in which case the 115 down onto the bony structure beneath, structure De.

heteroceting inflammation has seriously to cutanous structures, union by the sac with gauze in the day and allow the wound to cut if day and allow the wound to cut if day from the bottom. The number cut is a great from the cutanous day are sult of this opera-

tion has not been great. Occasionally the pressure made on the cornea results in some damage, and the rupture of acute ulers of the cornea from the same cause are not unknown. Veraile has reported a case in which the sac and gland were removed after repeated attacks of dearyocystitis, in which an anomalous paralytic neurokeratitis developed.

The resulting effect upon the epiphora is the most interesting topic in this discussion, for epiphora is one of the most disagreeable symptoms to the patient, and often perhaps the symptom which makes him consent to operation The flowing of tears previous to operation, rendered more profuse by refractive strain, mental and physical distress, and local irritation of the conjunctival sac, such as wind, cold, etc. appears to be increased still more by an stritation proceding from the inflamed sac Lancaster states that experiments on guinea pigs show that extirpation of normal sacs is followed by diminution, not only of the activity but also of the size of the lachrymal gland—a compensatory atrophy and it is highly possible that a chronic irritation of the sac also increases the activity of the gland. If this is so, it would account for the undoubted fact that extirpation of the lachrymal sac does diminish this annoying symptom, although it is seldom the fact that local irritation of the conjunctival sac by cold winds, etc., does not produce a temporary epiphora after the operation,

epipulora after the operation.

In 310 cases reported by Elliot in India, there were but 53 cases which were followed up for three months, as to the effect upon the epiphora. Of these, nine failed to have the epipulora relieved. In such cases, it is generally considered necessary to remove the whole, or a large portion of the tear gland I have asked a number of operators who pursue this method frequently, and have been told that they have seldom found it necessary to do this additional operation. Personally I have never done an excision of the tear gland, and I prefer to leave the discussion of that portion of the subject to some

gentleman of larger experience.

Several years ago, when I first began to extinuate tear sacs for this condition, I

operated on six cases by extirpation of the tear sac on one side, and by opening into the sac on the other side and making a large opening through into the nose by means of the largest sizes of Theobald's probes at the first sitting. This opening, which did not profess to be anything but a method of making a drainage opening through the bone, healed with a permanent drainage canal, although it was not found necessary to pass large probes more than three or four times, these occasions being included within ten days or two weeks. Three of these cases I have been able to follow since, and all three

have stated to me repeatedly that there was more epiphora on the side in which the extirpation of the sac was performed that upon the other. Therefore, it is evident that the result of the operation is not as perfect from the point of view of function as it is from that of protecting the eye from infections proceeding from the lachrymal apparatus, nevertheless, the operation is steadily growing in favor, and properly so. While not ideal, it does give us a practical method of stopping an annoying and dangerous series of events in a class who cannot be treated successfully by any other method.

A CONSIDERATION OF FINAL RESULTS IN HYPOPHYSEAL SURGERY 1

WITE REPORT OF A CASE

BY ALLEN B KANAVEL, M. D., CHICAGO

HILE the final word has not by means been said as to the technique involved in the surgical treatment of diseases of the hypophysis, the general line of procedure at least has been determined, and we have progressed far enough to demonstrate the propriety and feasibility of surgical intervention in certain cases.

A sufficient number of patients have now been subjected to operation for us to begin to consider carefully the results of these operations, not alone as to life, but as to the allevnation of the symptoms and the influence upon the course of the disease after the lapse of a considerable period, to the end that we may know what may be expected as a final result, and may not rush our patients into ill-advised operations before the possibilities are known Recause a patient survives an operation is no proof that the operation was successful. The following case is, therefore, reported.

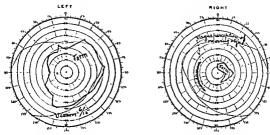
Typical Frälich type of hypophyseal disease, suffering with marked signs of intracranual pressure Operated upon two years ago, infransal route, cyst cucuated; recovery, result of feeding piuntary gland over two years

Stanley W, aged 18, white male, native of United States, Admitted to Wesley Hospital

February 20 1011, under diagnosis of hypophyseal discase made by Dr Hugh T Patrick. Complaint Severe frontal and temporal headache. Impaired vision patient could not recognize objects, only light and darkness Photophobia Persistent counting. Femily history No. history of tuber-counting femily history. No. history of tuber-bowels regular. Previous tilners. Meallet, whooping-couch and chicken-pov in childhood, typhoid at eight, being sick about three months. Suifered with caures still he was 16. Has been weakly ever

since he had typhoid Present illness The present trouble dates from his rath year Though mentally bright and well developed he lacked physical development and vigor. His appearance was aniemic His voice did not show the normal change which takes place about puberty, and he remained sexually undeveloped. He began to have frequent attacks of sick beadaches, with which he had considerable gastric distress, nausea, and vomiting. During his 15tb year he began to notice that his eyesight was failing and obtained considerable relief by using glasses, but on account of more or less photophobia he wore smoked glasses part of the time. Under these conditions he continued his work as clerk in comparative comfort until about a month ago, when his eyes suddenly failed him. He had aching pains in the eyeballs At times his pupils would dilate markedly, especially when the pain was bad Photophobia and impaired vision became more marked With this he developed an acute and spasmodic frontal and temporal headache. The pains were sharp and shooting and frequently

1 Read before the Western Surgical Association Cuscinnati Ohio December 21 1012



lig 1 Fre findings (Dr Westrott) February 3, 1911 Fighteen flays before operation

radiated into the occupital region. On Lebrary 18 he had his first attack of comiting, which he attributes to the onset of a paroxysm of healache. These attributes to the onset of severe so that for three days he has had continued healache and comiting.

and has eaten nothing

Laumination General appearance, that of a boy of 12 years slightly anymu, full growth of unils, and hair on head, general conformation, adiposity above the average but not excessive due possibly to prolonged comiting, actinge marked in urine, no excessive development of breasts, no growth of hair on body or pubic region, except time hairs invisible to ordinary inspertion, back normal cars normal, teeth normal, nose normal, right eve slightly divergent pupils slightly large and this have been so while patient has been in hospital subsequent to the operation Patient states that they are always so during his attacks of pun but that they may be smiller between attacks. The restricles are both present but they and the pensons very small

The examination of the thyroid, lungs, heart, and abdomen negative. Height 145 cm. (Patient says

his heacht was 4 ft o in 'tt e '15 cm 'a year ap')
Operation I bertury zi, 1911, by Dr. Kanavel,
assisted by Dr. Wolfer, P. Gordon Wilson, B. C.
Cushwa, and H. M. Reherer. Patient had been
green wenterpoin a bome for mis even the patients of the patients now, was priced with strips of guies
saturated with 5 per cent occain, and as soon as the
patient was amythetized these incre removed and
the nose packed with adrenalin gause full strength
The amythetic (trher) was now changed from out
to rectal and this was given throughout the operawith commotles satisfaction of Dr. J. P. Charchi,
with commotles satisfaction.

In instant was made close uniter the nose and on the need crease at the side, and the technique carand out exactly as described in previous contributions? The mulille and inferior turbinates were moved. There was some difficulty in locating the sphenoidal ostea so that it was necessary to shoul through bone ilirectly. No evidence of a sphenoid sell was found at any time. The dura were spored and a bulging pearl mass about 34 inch in shameter was exposed. There was no marked pulsation until partial evacuation of the cyst had been maile to attempt was made to aspirate the tumor since a shagnosis of a cyst had been made by Dr kannel The aspirator did not work, however so that it was concluded that the diagnosis of a sast was encorrect and with a scaloel an incision was maile the length of the exposure through the dura Immediately the underlying tissue bulged through and a chocolate colored fluid escaped, fully

*I Am M Ass Now so spop and Surgery Gynecology and Obstet-

	Horostal	
		Oct #7
	Feb 20 33	
Circumference of head glabella 14 oc pt	52 Cm6	31 4
Angle of taw closed to bregma	60 Cm	
Circumference of chest exp 73 m	67 H cm esp	67 us 74
Circumletence around shoul lers	77	81
Circumletence of humerus at mid fle		
Circumference of forcarm at mid-lie	1575	,6
Length som acromium to tip of middle		
facer	65	63
Length elbow to tip of middle figuer	50	10
Cocumference thuch at melile	35	50
Circumicrence h p through Irochanter	70	23.5
Clecumictence leg at middle	35	27
Length of leg and sup spens to ant mel		
leulus	79100	73 3

Or Goetz of Naperville says that he had a third development of teeth 5 or 6 of the second group being cast off at about 22 and 5 this group appearing

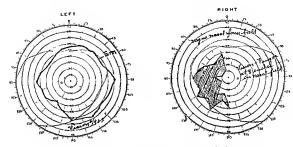


Fig 2 Lye findings (Dr Westcott) October 15 1912 | Iwenty months after operation

an ounce ran out of which about one half ounce was aved and given to Dr. S. A Mathews for examination who reported that the fluid contained a pressure substance. He trujected it into a dog and obtained an increase of 10 mm pressure of mercury which pressured for half am hour. Do. Mathews draws attention to the fact that cyaste fluids generally cause a fall in blood pressure.

The cyst was curetted thoroughly and the contents given to Dr Zeit for examination. This consisted of a granular detritis. In attempt was made to secure the cyst wall but it was unavailing

A strip of lodoform gauze was inserted into the cost and the end brought out through the nose The nose was pracked with strips of gauze, the posterior rusal plug, which had been inserted before the operation and which had effectually prevented the blood from entering the wound, was left in

The nose was sutured in position the septum heing brought to the median line and held in place by the ends of the packing strips which were brought out through the nose (Fig. 3)

The patient left the table in good condition Subsequently he was given olive oil by rectum to allay the irritation of the other Normal salt was

given sulicutaneously as a stimulant and to help remove the ether from the system Subsequent history. The first strips of graze were removed at the end of 36 hours more at the end of

48 hours and the final strip leading into the cyst was removed in 56 hours with the posterior massliplug. Following the operation the patient complimed in utaken and controlled the state and contr

of he tdache and somitted rather constantly for 48 hours when the comiting exacted completely. The cause of the comiting may have been either a retention in the cyst or post anasolatete comiting I am rather inclined to look upon the former as the

cause since it came on so suddinly, and after vomiting the patient would have complete ruler until the next attack. This view is further supported by the fact that on removing the strip of gauze at the cind of all hours a gush of at feast one half ounce of fault flowed down, followed by cumplete cessation and those down, followed by cumplete cessation to the fault of
His polyura returned after about ten days. Then it was noted that he had a murked acctonuria which yielded lurgely under levulose and carbo bydrate treatment. The polyura also subsided rapidly

In infection suggestive of an erysticlas developed in the face, which subsided in a week. No other outward symptoms appeared an immediate improvement an immediate improvement. His headache disappeared on the third day and has not returned

I am indebted to Dr Cassius C Wescott for the two charts denoting the changes in the fields after the operation and for the following notes upon the eye findings."

5 W American male was seen first at the age of 15 years on October 8 1908 complaining of dimness of vision. He also complained of pain frontal and temporal radiating to the occipit. Photophobia and poor vision were helped in 1904 by

securing glasses which he wore for a months. With time of examination (October 1908) he stated that his vision half become dum in the right of the properties of the processing the proces



ing a fachuique (author s mi thod)

which was regarded as an bosterial manifestation. Ilis opinion was stringthem if is the improvement in the right vision to 6 is in twelve days, and to 6 is in one week more, with practically no treatment except strong suggestion of recovery. Refraction under nitropic cyclopkgis on October 28 revioled the following.

Its was green this correction less to so sph

"Mother further was heard from the boy until the man you'll when he reported with the complunt of sexter such handrohe, which he attributed to a full four weeks pressured. He had shoped on an ice pressured and struck the brick of his head le was stumed but did not lose consciousness and successful in walking to his home a distance real ity blocks, without help. He was stumed that we that sume straily his considerable had been pointive that some straily his considerable that the fadure to a time more capably therefare until one secbofore reporting when a sudden decrease in visua occurred, more mandest in the right eye, which he-

son to turn outwards. Upon examination, we found the left eye to fix white the right inverged moderately. Ordaly mosteroils were full in all directions, though white expose were used to the expose the expose which expose open attempted come expose using suitability and with the left eye. The complete year and which the corner elective slightly a year, and reasonable the right post proposed to the right post proposed to the right and occasionally, when bright light was the right eye, the pipul some proposed that which wilely and then exhibit happus, convergence, moderate light caused no common of either proposed the desired proposed to the right eye, the right eye of the right eye, the pipul some proposed to the right eye, the pipul some proposed to the right eye, the pipul some proposed to the right eye of the righ

both pupils when both were simultaneously dlu-

Intraocular examination showed the media to be clear, both nerve heads gray, the right being decided. ly more atrophic than the left, with a small pigment heap at the upper temporal border. The disc edges were well defined and there was no evidence of press ous neuritis The arteries were slightly contracted and tortuous, but the vessels and the central area of the retina appeared more nearly normal than one would suppose with such atrophic discs. The peripheral parts of both reting were thinned, the choroidal circulation showing very plainly 6/45, L V 6 15 not improved by correction fields of vision, as seen in lig 4, show in the left eye a marked contraction in the temporal half, and in the right only a small paracentral area (temporal) preserved with a crescent-shaped area of very vague perception of the moving object in the nasal fickt

On Lebruary so 1912 after operation, he was comportable and the left vision still 6 g. On March 7, he complained of blurring in the left nasal field The left dre was lound to be very pale, almost the

color of the right disc

Rhino-copic examination revealed no mass propicting from the sphenoid but only an emberant mucous membrane. This field of vision of the left eye shows some (temporal counteration in compitted with the fields taken on March 30, 1011, but a walffield than that of I churary. 1011 (before open field than that of I churary. 1011 (before open field than that of I churary. 1011 (before open April 2, 1012; l. V = 0 0+2. MIT china was increved to gr. 2 sol 1 d.

On October 13, 1912 the patient called at our request. The fut issues 18 of 2. He is feeling well and working with comfort. The fields, (Fig. 2) show as the left a widening on the temporal sine equal to the field of March. 1911 (which is the best recorded), in the right eye there is a decided failure same. March. 1911, the form field being only vaque and himsted to the meast sade not reaching freation and henny santing in part of the upper and lower measurements. The first part of the upper and lower makes measurements of 1, 15 and 1, 15 an

Pollowing the operation the patient was given 8 gnt of the anterior lobe, pituitary gland, for six months No improvement was noted and it was therefore deemed advisable to change to the whole gland, which was done At the end of a year he was readmitted to the hospital and an attempt made to determine the sugar tolerance after Cushing's method With 120 gm of levulose we received no sugar reaction up to 30 gr of gland per day The patient refused to remain longer in the hospital, since he is in active business. We have therefore continued with 30 gr daily since, with the result that there has been a marked growth of hair upon the arms and legs, and a slight growth upon the face, pubes and axillar. There has been no return of the excessive adiposity On the other hand there

has been no bony growth, his height has not changed, and no sexual change has occurred

SUMMARY

Patient was suffering from a cust of the hypophysis, which had caused primarily the type of disease known as Frolich's syndrome, upon which had been superimposed an acute attack of brain pressure, with vomiting, headache and complete blindness due doubtless to a hæmorrhage into the cyst. The operation performed by the infranasal route, already described and used by myself, was successful in evacuating the cyst The walls of the cyst were curetted and the cyst packed The patient recovered and noted an immediate restoration of sight, practically complete in one eye and slight in the other Headache and all signs of brain pressure disappeared and this freedom from difficulty has persisted for over two years Meanwhile he has been fed upon varying doses of pituitary extract at first of the anterior lobe, and later of the whole gland, in doses varying from 12 to 30 gr daily There has been a distinct growth of hair upon the extremities and a slight growth upon the face, pubes, and axillæ He has lost his excessive adiposity There has



Fig 4 Stanley W One year after operation,

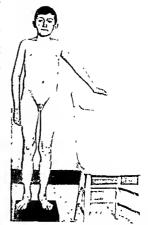


Fig 5 Stanley 11 One year after operation

been no growth in height, nor any development of sexual functions, although his general appearance is tending toward that of the male He is bright and capable of carrying on his work in a responsible position (Figs. 4 and 5)

A general review of the results reported to date by Cushing, Hirsch, von Liselsberg, Hochenegg, A. E. Halstead, and others may be summarized briefly as follows:

Prognasis or to life. Of 45 cases operated upon by the supranasi route, 17 have died, a mortality of 37 8 per cent. Von Eiselsberg's mortality in the 12 cases was 25 per cent. The infransal route, including the submucous modification, excluding Hirsch's cases, has given a mortality of about 27 per cent (36 cases, with 8 deaths). Imyself have operated

upon 3 cases, with 1 death Cushing's mortality has been about 13 per cent, while Hirsch in 26 cases has had 3 deaths, a mortality of 115 per cent Such figures are not conclusive by any means, but they do indicate that the mortality rate is rapidly falling as our experience grows, and that soon we may be justified in operating upon those cases which fall into the elective group and not contine ourselves, as at present to the operations of necessity

Prognosis as to ultimate results What, in various types of disease, may be looked for as the ultimate result? While it is too early to prognosticate this, a review of the literature as well as our experience would seem to indi-

cate the following

Cysts may be operated upon with particu larly good results as to local pressure. That they may recur the experience of Horsley demonstrates 'fhat they often do not is proved by my experience in the case reported, as well as that of you Liselsberg, who reports two cases well two years after the operation Hirsch has operated upon five cysts and states that they have good chances for amehoration of symptoms. The eye signs have been uniformly bettered unless complete nerve atrophy was present. The excessive adiposity has generally been lessened if the operative procedures have been supplemented by whole gland feeding The sexual development has been little affected, although von Liselsberg reports slight change in one case. Marked change in growth has not as yet been produced, even with gland feeding. The growth of hair and a tendency to change from the female to the male type has followed frequently if gland feeding was instituted

Owing to the fact that acute pressure symptoms in these cases are due often to hæmorrhage into a cyst, an absolutely bad prognosis cannot be given in those cases in which operation is refused since it has occurred that the hamorrhage has been absorbed and the evidence of acute pressure has disappeared. In these cases, and others not operated upon whole gland feeding may have some effect on the symptoms mentioned above, but certainly not as marked as in those cases operated upon and treated by subsequent feeding

The results in operations upon acromegales are not so definite, due possibly to the fact that operation has been performed alter hyperpituitarism has produced its results and not at the inception of the disease.

There has generally been a recession of the swelling of the soft parts but no effect upon the bones. Menstruation has been restored in several cases (Hochenegg, von Eiselsberg), and Cushing reports the return of male sexual function one year after operation which was supplemented by gland feeding. The eyesight, when involved, has been favorably affected. There has not been a marked loss of weight, even with feeding. It is to be noted that these cases of acromegaly which have gone over into the state of hyponitiutarism with mental symptoms seem to be markedly benefited by feeding without operation (Cushing) Sufficient observations have not accumulated to give us any data as to the

effect upon growth in the incinient cases The effect in adiposis dolorosa, von Recklinghausen's disease various dyspituitarisms, and allied conditions cannot be stated at this

As to the type of tumor The favorable results in cysts has already been commented upon The adenomata should be divided into two groups those which have grown out of the sella and become intracranial, and those still intrasellar In the former group, Ifirsch reports upon 13 cases in which the local pressure was relieved with considerable improvement of vision and at times amelioration of certain general symptoms, but for the most part the operation may be described as palliative

In the second group in which are often found the early acromegalies, there are often no typical signs and symptoms, atypical evidences, however, have caused a resort to the X-ray, and the bulging sella with a narrow outlet has confirmed the diagnosis. This is the type of case offering the greatest possibility of cure if attacked promptly. possibility is emphasized by the brilliant result obtained by Halstead, in whose patient (suffering from an adenoma) there has been no return of the tumor after over 3 years. The malignant tumors are not common,

but when they do occur the outcome is of course, fatal.

OFNERALIZATIONS

Generalizations make no claim to absolute correctness, they only mark the stages of our progress, and what is said to-day may be proved incorrect to-morrow They may. however, direct the lines of advance

Choice of operation: intracramal tersus transphenoidal At the present time one cannot say definitely which procedure will be the one of choice. Certain general principles can be laid down, however, and the lines of

future work suggested

The transphenoidal route cannot, unfortunately, be rendered absolutely aseptic, and therefore meningitis is always a possibility, although that menace is growing less as our experience accumulates This route is not available for tumors lying in juxtaposition to the hypophysis and hence giving hypophyseal symptoms Moreover one cannot remove all the tumor when it has extended widely outside of the sella turcica

The intracranial route is not feasible for tumors confined to the sella turcica be only palliative in a majority of cases, since it does not become the operation of choice until the tumor is far advanced, and in most cases it will be impossible to remove the part of the tumor lying in the sella turcica fore we may say that tumors lying for the most part in the sella turcica should be reached by the infranasal route

Cysts may be reached and drained by either route, but more permanent results may he hoped for from the transphenoidal route, since this affords room to grow and makes subsequent puncture and drainage easy

Tumors that have surely grown beyond the sella turcica can be reached by the intracranial route Neighborhood tumors may be

reached in the same manner

In this connection it should be remembered that the transphenoidal route gives a decompression opening, in case of future growth, for the local structures as well as for the brain, while the intracranial in a majority of cases gives relief for general brain pressure only. In general, then, in old cases in which paliation only is sought the intracranial route is the operation of choice, in those in which we hope for permanent results we must use the transphenoidal, although the danger of infection is greater It is to be hoped, however, that the future may suggest some intracranial route that will offer permanent relief with a minimum of danger

Choice of individual operation Not enough operations have been attempted by the intracranial method to choose between them Horsley has apparently had good results with the approach through the middle fossa, although his immediate and ultimate results have not been published. The ingenious method of McArthur, the McArthur Frazier. or that method combined with a preliminary Krause flap, would seem to offer many ad-

vantages in extensive growths

Of the transphenoidal methods, an experience with three cases leads one to resterate the statements previously made, namely, that the infranasal approach as described, or some of its modifications (Halstead, Hirsch, Cushing), should be the operation of choice While all credit should be given to Schloffer, von Eiselsberg, Hochenegg and others who have operated earlier by the supranasal route, when one contrasts the ease and simplicity of the infranasal approach with the mutilation. difficulty, and added danger of infection of the supranasal, the latter will surely be abandoned

Concerning the modifications of the infranasal route the labio-buccal incision of Halstead has given a most brilliant result in the hands of its originator and others. It has the advantage of leaving absolutely no scar upon the face, and the disadvantage of having the incision and operative field in the To avoid the increased danger of an aspiration pneumonia, Halstead has given his anæsthesia through a tracheotomy wound

Making the incision in the crease under the nose has the advantage of having a field entirely outside of the mouth and the disadvantage of the scar, although in four cases which came under our observation this was invisible to ordinary inspection

The operation of Tien is unnecessarily extensive

The operation of Hirsch should receive most serious consideration. In those cases in which the tumor is small or a cyst is present, it is probable that the submucous operation can be done in stages with a minimum of danger. Yet where the nose is small or where we wish to remove as much of the tumor as is possible, a more extensive field will be found advisable. We would suggest in certain cases the possibility of cutting the basal attachment of the septum of the external narcs and turning this aside add materially to the room.

It is possible, of course, to add the submucous principle to any of the infranasal

procedures. Indications for operation The indications for operation in cases of hypophyseal disease may be classified as absolute and relative Operation is absolutely indicated in those cases in which the tumor immediately seopardizes the life of the individual or is causing progressive blindness. It is relatively demanded when, because of perverted or increased or decreased secretion, the well-being and ultimately the life of the individual is threatened Therefore, if the tumor is growing rapidly or has grown to a large size, or if a cyst has suddenly filled, we will have pressure

symptoms both locally and generally that will imperatively demand intervention. As the safety of the operation increases the field of the relative demand will be broadened.

Just how far this will extend cannot be fully stated now, when our knowledge of the perverted states is limited. Thanks to the magnificent and painstaking work of Cushing, we have a basis at least upon which study may be made.

In general it may be stated that the adipo-e genital type of disease where an enlarged sella can be shown should be subjected to operation and fed with the whole gland This is particularly true since so many of these cases. as shown by Lewis in his careful study, are associated with cysts, in which operation is

most successful. Acromegaly should be treated most conservatively, particularly since many of the cases have passed over into the stage of hypopituitarism. As the safety of the surgical procedures grows, operation should be attempted in the early stages of the disease, before the growth has left the sella. The more complicated and late cases and those with atypical signs should be treated medically until the results in the typical cases are well established

ECTOPIC PREGNANCY ASSOCIATED WITH ANOMALOUS FALLOPIAN TUBES

BY O V HUFFMAN M D. NEW YORK CITY Pathologist Sloude Hospital for Women

X JE wish to report an exceptionally good specimen of ectopic pregnancy This specimen, besides affording us opportunity to study the uterus, tubes, and ovaries with a view to

finding some confirmation of the inflammation or obstruction theories, affords us some evidence for a new working hypothesis as to the cause of ectopic pregnancy 1

This hypothesis is that ectopic pregnancy is determined by an anomalous imbedding 11 with to express my thanks to Professor F C Wood Director of Cancer Research Columbia University, for the countery of his laboratory literary and assistance

At present we are unable to recognize the anatomical factors which are necessary to an imbedding area, but we can assume that the special tissue may become misplaced, during the development of the tubes and uterus, from the Mullerian ducts The mutual relationship of imbedding area and fecundated ovum has been overlooked by most investigators in searching for the causes of ectopic pregnancy The problem is physiological rather than mechanical In the first place, why does the fecundated ovum under normal conditions imbed in the uterine mucosa? Certainly there must be a mutual relationship. since the ovum does not imbed in the cervix The distribution of placentation and imbedding areas is still better defined in some of the lower animals, as, for instance, the cotyledonary burrs of the cow and the Hollard coussinets of the rabbit, which occur in the virgin uterine mucosa

The difficulty in the study of tubal pregnancy is that we do not have an opportunity to examine the tube when the ovum is small, but only after it has grown and extensively altered the anatomy of the tube The condition of the hyperplastic epithelium at the site of the ovum at this time cannot be considered a criterion of its condition before the ovum became imbedded, nor can investigators agree as to whether minor abnormalities at the site of the ovum are to be regarded as present before or caused by the growth of the ovum Another practical difficulty in the study of ectonic pregnancy is the fact that many specimens are rendered worthless by the hæmorrhage, rupture, and adhesions But even with these difficulties, a sufficiently large number of cases have been observed where no obstruction or inflammatory condition could be found to account for the implantation of the oxum at the abnormal site

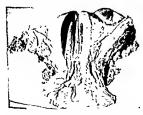


Fig 1 Photograph showing tumor in the left tube silunted in the isthmus and caused by the growth of the ovum The fimbrialed extremity of the left tube is bound down to the left ovary, which contains a large corpus lu leum verum. The adhesions are delicate. There is no evidence of hemalosalpins or pyosalpins. The uterine cavity has been opened to show the decidua parietalis vers



fig 2 Diagram crimesenting the anterior aspect of the left Fallopian tube near its outer end where it is bent downward and backward, being bound to the overy by recent adhesions caused by the hemorrhage. Here on the anterior aspect there is an accessory lube, smaller and less perfectly formed than the accessory tube on the right side Its free extremity is somewhat necrotic having rested in blood clot. The lumen of the miniature tube does not communicate with that of the mature tube Near the fimbrie there is a small subscrous cyst

Diagram representing the anterior aspect of the ambristed extremily of the right Follopian tube 15 cm distant from the mucoperitoneal junction on the anterosuperior aspect, there is a miniature accessory tube which presents a patent ostium abdominale but does not communicate with the fully developed lube

For the specimen reported here (Figs 1, 2, and 3) we are indebted to Dr. John H. Larkin. pathologist to the City Hospital, who removed the uterus, tubes, and adnexa in toto from the body of a woman who died as the result of hæmorrhage following rupture of the tube Here, as stated above, we were able to examine both tubes and the uterus 'The ovum had become imbedded in the isthmus of the left tube, and in size corresponded to a gestation of about six weeks' duration The fimbriated extremity of the left tube was attached to the left ovary, which contains a large cornuluteum, by some delicate adhesions which are apparently recent, having been caused in all probability by the blood which sur-There was no hamorrhage rounded them within the lumen of the tube The thin portion of the wall of the tube covering the ovum posteriorly presented a minute rupture, from which the hamorrhage had occurred With the exception of the anomalies presently to be described, both tubes were normal!

for the microscopical examination special care was given to making a series of sections from the portion of the tube between the orum and the mirror cavity to find if possible any obstruction which could him let the demone carry to find a considerany observation which would be less the process of a normal yours, and a series of sections to me be take the sixes of the owns and let were a sufficient into the take the six of the owns and let were a sufficient with the six of the owns are presented in the administration. The find one are operated as a six on accord with the results obtained from the study of section and the constraint of which presented very considerance of the present of the six of t nterus was enlarged and was hard with decubia vera o s em in thickness. At this point we might regard the specimen as a case of cetopic pregnancy without anything (o explain its cause

We now come to the conditions which had us to our hypothesis. Upon careful examination two rudimentary fallogum tubes are observed one attached to each of the fully diveloped apparently normal tubes near their funbriated extremities They minia. interacessors tubes are about 1 cm in length; this have umbristed extremities with ostia, but they do not communicate with the lumina of the large tubes Their muora is thrown nto folds and the epithehum is collated

The explanation which we offer for the cause of this tubal pregnancy is based on the fact that can't tube is congenitally malformed as indicated by a supernumerary tube near its miter cikl The inference is that early in the embryological development of this particular unhydral there was a duplication of the Mullerian duris, and it is not unreasonable to suppose that with retrogression or subsidence in the growth of the one pair those portions which should have formed the second uteros with all the factors which determine an implantation area became fused as "rests" with the fully developed tubes, and that such a rest permitted the ayum to imbed. This theory was approached by Webster when he stated tentatively that the ovum can imbed only in Mullerian tissue capable of ileudual reaction but today the implantation factors are not to be confused with the decidual cells which are regarded as protective to the maternal organism against the two extensive invasion of the trouboblist Although it has been proved by experiment that obstruction alone cannot cause cetopic pregnancy, it is still to be kept in minit as a possible factor in holding hack the exam until the trophoderm is sufficiently ileveloped to imbed in the anomalous recentive area, which is the real physiological cause

As to the frequency of anomalous tubes we have no reliable data Richards some sixts years ago, called attention to the great frequency of accessory astia, von Winckel has found malformed tubes rather rare. Doran, in

1882, published the results of his examination of 1,000 specimens, in which he found mal formations present in of per cent With more care and the u-e of micro-capical meth ml, it is fair to assume that a much greater pareentage of almorroal tube, would have been found. It is needless to say that a cursors exampliation does not reveal some of thee anomalies. It requires the most dalgert care to find them

In addition to this unusually fine specimen, we have studied twents four specimens of tubal pregnancy removed by operation sixteen from St. Luke's Husnital and eight from Sloane Hospital In unh nine of thee twenty four specimens was the anatomy of the tube sufficiently preserved to be examined for minor anomalies. In the other fifteen specimens the large size of the gestation the rupture, blassl clot, and adhesions, made it impossible to determine whether or not an animaly existed

The nine specimens which could be exam aned with certainty revealed the following anomalies in the pregnant tubes

One with four accessory ostia One with a small cost at the imbriated extremity, to which is attached a small vascular cord, 15 cm long, being constructed at the attachment and surrounded by some free timbrie At the other end of this cord which hangs free, there is a small cyst, regreen One with an accessiry oslium near its

finilizated extremity.

One with an anomalous tubule on the anterior aspect of the broad ligament, and associated with three supernumerary ovaries

Two specimens which did not reveal any anomaly in the pregnant tube were accompanied by the tubes from the opposite side, which were removed at the same time. One of these non pregnant tubes had an accessory ostium and a pedunculated cyst near by and on top of the tube. The cyst contained cascons matter. The other non-pregnant tube was very short and, together with the ovary, rested on a parovarian cyst 5 cm in diameter.

Of the three apparently normal tube- one was associated with an uvarian cv 4.5cm indi ameter, evidently derived from the rete ovarit.

Thus we see that in specimens which can

be examined, even with the difficulties mentioned above, more than lifty per cent have gross indications of malformation

If we could obtain specimens for study when the ovum was quite small we might learn more. Recently, Rubin had the good fortune to obtain a specimen of tubal pregnancy where the ovum was very small. In studying the anatomy of this case Rubin regarded the on um as arrested by a thickened muscular spur. This spur projected into the lumen of the tube just above an opening into a diverticulum. Here we believe the implantation of the ovum took place because of an anomalous imbedding area, and we consider the diverticulum simply an index to the abnormal con dition of the tube.

In regard to the ovary the only other organ in which the ovum is known to imbed outside of the uterus and tubes, this hypothesis is still applicable Van Tussenbrock, who gave us the first authoritative description of an ovarian pregnancy described epithelioid cells of maternal origin near the ovum, and Webster, our leading authority on ectopic pregnancy, has stated his belief that the ovum must imbed in Mullerian tissue. In Van Tussenbrook's specimen the Graatian follick lined with lutein cells formed a cul-de-sac to the ovisac which was contained within the ovarian tissue. In the rupture of the Granhan follicle a small anomalous imbedding area which might have been included in the overy could have been exposed and permitted im plantation. We believe this is what occurred in her specimen. Webster's theory in regard to 'rests" of decidual reacting cells. and his observations in support of it, support our theory as far as they go but fail to account for those cases where no decidual cells are found However, a lew decidual cells might accompany the determining factor, and these might be destroyed by the trophoblast or overlooked when sought in the neighborhood of the ovum which has grown to gigantic proportions in comparison Recently, Graham, in describing an ovarian pregnancy, pointed out that a separate remnant of the Fallopian tube was in the ovarian mass interpreted this, however, as having been twisted off and separated from the tube by

the growth of the own. In the only specimen of ovarian pregnancy which is in our laboratory the accompanying l'allopian tube is small short, and straight malformed and rests on top of a large parox arian esst.

In this paper we have contined our remarks to a discussion of objective evidence regardless of theories based upon clinical data. Worth has given us an admirable review of the literature and ample descriptions of tubal pregnancies. We have examined and studied twenty ar specimens of ectopic pregnancy. but of this number only ten could be examined with certainty for anomalies and of these ten seven were associated with gross mal-From the results of these studformations. ies we believe there is ample support for the theory that ectopic pregnancy is caused by imbedding areas which were misplaced during the maldevelopment of the Mullerian duct

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CERTAIN PROBLEMS AND PROCEDURES IN THE SURGERY OF THE SPINAL COLUMN¹

BY CHARLES IT TRAZELR, M. D., PHILADESPHIA

VLRSHADOWED by the interest and publicity that have been given to the surgery of the cranial contents. The surgery of the spinal column until quite recently has not received the attention it deserves. In a comparative review of the ksions of the brain and of the spinal cord. one finds that there are more lesions of the cord which lend themselves to surgical intervention, and that for other reasons the cord offers a more fruitful field. The accessibility of the cord throughout its entire length and on every aspect is a point of advantage, and, other things being equal, the absence of important vital structures and other factors combine to make all properly conducted operative procedures upon the cord freer from risk than operations upon the cranial contents

Of the operative treatment of fractures of the some, volumes have been written and numberless oninions expressed, but without agreement as to the time or the propriety of operating in recent cases. Quite the most notable contribution to the subject was made to this congress a year ago by Allen, whose cleverly conducted experiments promised to open up a new era in the operative treatment of fractures and to sweep away the pessimism with which we have been heset. Allen found that the serious effects of contusion of the cord, such as might attend fracture or fracture dislocation, and such as would, if left untreated result in a complete permanent paraplegia, could be entirely relieved by a median incision in the cord at the site of the injury The object of the incision was to allow the escape of the traumatic effusion, blood, and lymph, whose presence alone would result in the destruction of cord tissue The results of Alkn's experiments were so striking and brilliant as to deserve the careful consideration of surgeons. While the outcome of the first opera-

tion which I performed after Dr. Allen's experiments were completed was not pleasing, I regard the matter as of enough importance to place on record even an unsuccessful case. A young man fell from a roof and sustained a fracture of the mid dursal vertebra. An examination within an hour of the accident revealed the stens of complete transverse lesion. Within five hours of the accident we exposed the cord and found it swellen and tense at the site of the injury. With the slender blade of a cataract knife an incision 1 cm long was made in the median line at the site of the contusion, and immediately there was a gush of bloody fluid which had evidently been retained under great a condition analogous to that tension described by Allen I'our months have clapsed since the operation, and while there has been some return of sensation there has been as yet no return of muscular power, While failing in this instance to secure more pronounced results, I believe surgeons should give thoughtful consideration to this proposed measure of relief in what are otherwise hopeless cases, and should repeat the operation sufficiently often other to establish it as a means of restoring function or to prove its ineflicacy. It is needless to say that the incision in the cord must be made in the precise way and with the precautions which Allen has indicated

There are also occasions when, in late cases of spinal fracture, a laminectomy has been performed to advantage, either for the relief of pressure on the cord itself or upon the motor or sensors roots.

There is still much doubt and uncertantly as to the pathology of circumscribed spinal meningitis. In fact, there are some among the neuropathologists who queston the existence of a strictly circumscribed process, and yet on the operating table I have seen a condition which corresponds with singular accuracy to that which has been described by others, and there is no doubt at all that the evacuation of the fluid in these cases is followed by the relief of symptoms

Of tumors of the spinal cord and its membranes, very many more lend themselves to radical treatment than similar lesions of the brain, especially those taking their origin from the meninges, which in so many instances are encapsulated and easily removed in their entirety, and, while belonging to the malignant group, such as the fibrosarcomata or endotheliomata, tend to recur locally rather than to metastasize to other internal Mention should be made of the contribution to the surgery of the intramedullary tumors by Elsberg, who observed the tendency to spontaneous extrusion of the tumor following incision of the overlying membranes

I should like to refer particularly to the relief which may be afforded the excruciating pains of inoperable tumors of the spinal cord, no matter what their origin may be, and in this connection may allude to a case (File No 11263, U H) referred to me by Dr Mills, in which, upon the removal of the laminæ of the sixth, seventh, and eighth dor sal vertebræ, an extensive metastatic lesion was uncovered involving the seventh dorsal vertebra, the dura, and the seventh and eighth dorsal roots (Fig 1) That portion of the dura which was the seat of the malignant infiltration was removed, and the posterior roots of the seventh and eighth dorsal segments removed Following this intervention, the patient has remained free from pain

Section of the posterior or dorsal roots has been given wide publicity of late years through its application to the treatment of many conductors, notably through the brillhant results obtained by the distinguished speaker and guest of the evening in the treatment of spasticity. The latter problem has been so fully covered that I will not refer to my own experience in this connection, but speak only of the application of sensory root resection for the relief of pain. I have mentioned already the striking effect of division of the sensory roots in the relief of pain in a case of sensory roots in the relief of pain in a case of

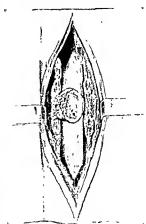


Fig. 1 Drawing from a photograph of a metastatic arctiona of the dura which, after division of the posterior roots involved, was removed as a palliative procedure for the relief of pain

an inoperable carcinoma of the vertebras. and the efficacy of this measure should not be lost sight of in the insufferable pain that attends involvement of the brachial plexus either as the result of trauma or the extension of an inoperable carcinoma of the breast, I could cite instances of both, but one will suffice for illustration. An amputation (K. B File, No. 65, P. E. H.) of the breast had been performed and local recurrence was rapid. When I saw the patient for the first time three years later, the upper extremity was swollen and ordematous and the patient complained bitterly of the pain night and day. There was a large recurrent mass in the axilla and supraclavicular region, and amputation would have been of no avail. With



Fig. 2. Photograph of patient who was entirely relieved of severe gastric crises by resection of the seventh, eighth minth, and tenth posterior thoracic roots. Photograph shows area of amenthesis.

her ready consent I divided through a unlateral laminectomy the dorsal rosts of the infth, sixth and seventh cervical and first and second dorsal nerves. The operation was performed at one of the chinics of the congress a year ago, and since that time the partiant which has been under my observation ever since has enjoyed a measure of relief which more than justified the undertaking

My experience justifies this undertaking further in the relate of the gastric crises of tabes when all other measures have failed I say this advisedly, because, although the majority if not all of the underlying cord lesions are of hette origin, there are certain cases which do not respond to the administration of mercury, but have been relieved by salvarsan or neosalvarsan. Within the past three months I have had two cases referred to me for operation because of the acute exacerbattons of pain, in both of which the

pain was controlled by successive injections of salvarsan The most striking result of root re-ection in my experience, of these cases where operation was undertaken as a last resort, was in the case of a middle-aged man (File No 10,122, U II) who, one year before I saw him, had had an abdominal operation on the supposition that he was suffering from gallstones. When he first came to me, the paroxyons, which recurred every four to six weeks, were excruciating in character (Fig 2) The seventh, eighth, ninth, and tenth dorsal roots were divided through a unifateral opening, the vomiting and pain were entirely relieved, and there has been no Although there have been rerecurrence corded instances of recurrence, which I believe should be attributed to the failure to cut a sufficient number of roots, this operation though not new, has not been given the recognition it deserves as a measure of relief for the intractable cases where the patients often become murphin habitués and die as a result of prolonged suffering and starvation

result of protonged sultring and startauon.

As for the plan of etypo-ling and dividing the sensory roots. I am still of the opinion that the intradural is to be preferred to the extradural method. While theoretically the danger of infection is less when the dural sac is not opined, I have never had a case of meningist develop by so doing, and there is no doubt but that the identification of the central roots, and there separation from the dorsal is more readily and accurately effected while they are still within the dural mem-

brane There is one phenomenon more than any other which has impressed me in resection of the sensory roots, namely the variability of the results. Whether in its effect upon spasticity upon the alleviation of pain, or in the resulting disturbance of sensation, there is a currous variability in the effects of resecting the same number of roots in any series of cases. To cite an extreme case in that of a patient with a brachial plexus injury, even after division of all the roots from which the brachial plexus derives its sensory supply, the sense of pain was not altogether relieved. In some cases, one finds a partial and in others a complete anæsthesia, in some

it is transitory and in others permanent, and again in others it is a hyperasthesia. These widely varying phenomena would seem to throw some doubt upon the present conception of the pathways of all afferent impulses, and at once suggest a field for investigation and inquiry as to whether the ventral roots do not play some part in the carrying of afferent impulses.

While to the sensory roots so much attention has been given in the variety of conditions to which allusion has already been made, the possibility of utilizing the motor or ventral roots of the cord has barely been touched upon. My interest in this phase of spinal surgery was first aroused in association with Dr. Charles K. Mills, in the treatment of a patient who had sustained an injury to the cord which had left him with a residual paralysis of the bladder, with absolute incontinence and the inevitable cystitis question arose as to whether by an intradural anastomosis of the ventral roots innervation to the muscles of the bladder could not be restored Investigating the nervous supply of the bladder, we found through the researches of Frankl Hochwart1 that the bladder has two or three sources of supply, and that one of these was through the third and fourth sacral segments and roots. On the cadaver, we found that the twelfth thoracic or first lumbar, if divided at their points of exit from the spinal canal, could be brought into contact with the third and fourth sacral roots in the cauda equina Finally it was decided to attempt to effect such an anastomosis in our patient (Fig. 3) The laminae of the twelfth thoracic and first and second lumbar vertebræ were removed and the first lumbar ventral root was divided at its point of exit from the cord To identify the sacral roots, the electrode was called into play second sacral root was identified by the movements of the toe which followed faradization (Fig 4) The next two roots, that is the third and fourth, were then divided, and an end-to-end anastomosis with the first lumbar effected with the finest Chinese salk. The



Fig. 3. Operation for anastomosis of the roots within the dural sax showing transverse slit in the dura to expose the first lumbar root at its point of exit from the vertebral sanal

contact and they were under no tension. Four months after the operation the patient reported that he was able to retain urine for a period of two and a half hours, and that there was some expulsive power of the bladder Eight months after the operation a further report stated that now he could dispense with the trinal, which he had hitherto worn constantly, for a period of twelve hours, and that with the assistance of pressure over the suprapuble region partial evacuation of the bladder was possible. An inquiry into the literature touching upon the subject revealed but one pertinent contribution had already conceived the principle of this operation and had conducted a series of investigations upon dogs, in which he observed that when the last lumbar was joined to the second and third sacral roots, electrical stimulation produced all the effects which followed stimulation on the untouched side

For the purpose of securing physiological data which would place upon a scientific basis the procedure of intradural root anastomosis,

divided nerves appeared to be in perfect

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der Hamblase 'Wen 1006



lig 4. Operation for involumests of the roots within the durit six showing end to end anythin sets between the tirst lumber sentral riots and the third and fourth suital.

a series of three operations were conducted in my laboratory by Dr A B Eisenbrey, In one there was no restoration of function, in a second a cross-mastamens was made on no sidle between the third and fourth lumbar roots. As a result of an electrical examination made, Dr A R Allen reported that the muscles responded to both faradic and galvanic stimulation, that there is an evident condition of restitution, and that in the course of a short time the reactions of degeneration now barely demonstrable will probably have disappeared. In a third observation, in which the sixth lumbar light, Allen reported that it was difficult to determine any difference between a modal and cathodal contraction in the affected muscles

These experiments and clinical phenomena are presented with the full understanding that they are in the nature of a preliminary The histological examination of the tissues removed from the experimental series and the further developments in the single clinical observation will place the operation on a more substantial footing. Suffice it to say now that the evidence, experimental and clinical, is favorable to our contention. Were we to attempt to forecast the possible indications of this operation, a number of lesions would at once suggest themselves, including not only the paralyses that follow trauma of the cord, but the terminal paraly-es of poliomyclitis. An investigation upon the cadaver has shown, as will be seen in the table, the numerous combinations, unilateral and crowed anastomoses, that would be possible (see table)

These investigations will be continued to definitely establish the utility of these

VENTRAL ROOF ANASTONOSES Opposet Atene Domail Lumbar Sacral Censal (envel 31 9 10 11 11 11 ì *** 3 11 12 10 11 11

Barely | Easily 1 Junt | Readily " at cm in length

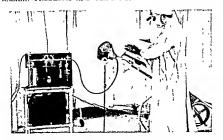
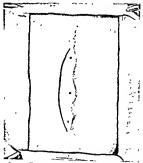


Fig. 5. Showing position of patient for operation in the midthoracic region the other being administered by the intratracheal insufflation method.

measures and their applicability to these and other diseases.

As has been said surgery of the spinal cord offers a more fruitful field than that of the brain and at the same time should be attended with a lower percentage of fatalities In my own experience, and I am quite sure there are many here whose experience in the question of mortality corresponds with mine. there have been but two deaths following operations for a great variety of lesions, in cluding tumors, spasticity, gastric crises traumatism, and paralyses, one of these was a case of multiple and inoperable sarcomata of the spinal cord and the other a case of spasticity in a child of low grade mentality The latter belong to a class which is notable for their lack of tolerance of operative intervention, and in which operative intervention should be practiced only in exceptional cases To reduce one's mortality to a minimum, certain factors of safety should be taken advantage of That the free escape of cerebrospinal fluid throughout the operation exerts a harmful influence is, I believe, an erroneous impression and one unfounded upon any scientific data however, disturbing to the operator to have the field of operation constantly bathed in fluid; and to arrest its escape one should take advantage of posture by keeping the head lower than the region of the cord uncovered, and at the same time prevent the escape of cerebro-pinal fluid by introducing a plug of cotton between the dura and cord provimal and distal to the seat of operation

Some operations upon the cord, such, for example, as that of intradural anastomosis,



I ig 6 Showing general direction of the cutaneous incision with relation to the spinous processes



Fig. 15 degraph taken during operation absoring introduction of plenger of gauge behind the durat Pap 6 of hermotatu purposes. 15 ph. held no position by Irai Ian natures while raises is less introduced.

may be somewhat tedious and prolonged For this mason, certain precautions are ile strable to avoid such complications as may arise from the administration of the ana-I am quite convinced that with or tients in the face down position, the respiratory function under the relaxation of deep anasthesia is impaired. The weight of the hody itself offers an impediment to the free respirators function and under surgical anasthesia the loss of muscular tone is a well known physiological fact. For these reasons which may be regarded as reasonable explanations, the patient in the prone position in prolonged an inthesia shows signs of respiratory distress. The improvement which fullows a change to the lateral position may be offered as further evidence of the effect of position upon respiration. To place the matter upon a more scientific foundation, we have been investigating the problem by measuring the amount of expired air with a Bohr gasmuter and while time will not allow of a detailed account of the results of these investigations suffice it to say that a comparative study of cases has revealed the interesting and significant fact that the amount of expired air in the dor-al position is greater than that in the face-down position approximately in the ratio of 10 to 6 With these clinical and physiological data before

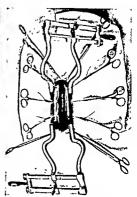


Fig. 8. Shaving feld ad operation. Note the oil will be a controlled in the marriers of the duri and they felders of given behind the durid flags to control owing and to keep the full of operation duri.

us, it is at once apparent that in spinal cases. Melitzer's method of anasthesia by intractical method is specifically indicated (Fig. 3) and we have therefore adopted it as a routine procedure and have come to regard it as a very important factor in reducing the risks attendue these operations.

There are other matters in the technique which are at least deserving of mention. The two stage operation is rarely necessary. We have reserved to it in hut one instance the miscular fayer should be exposed by refecting a semiliumer cutaneous flap (1) is of the fine of the cutaneous incision does not correspond with that in the aponeurs, thereby lessening the risk of a direct fistulous connection with the spinial canal The misculs should be separated from the spinons processes, not with a blunt but with a hym instrument, such as a chief or osteo-

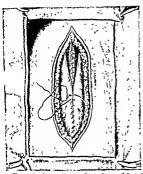
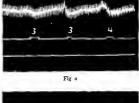


Fig. 9. In closing the wound two layers of bursed sutters are used, one through the sheath of the erector spins muscles and the other through the intravertebral sponeurous. The latter is the stronger of the two, and therefore the more important structure. tome A unilateral laminectomy has no

advantages and does not give an exposure adequate for thorough exploration or intraspinal manipulation, self-retaining retractors are convenient and permit of the continuation of the operation without assistance (Fig. 7); small tampons introduced behind each of the dural flaps, which are retained in a convenient place with traction sutures, will control bleeding from the two most constant sources (Fig. 8), the cut surfaces of the laminæ and the spinal plexus of veins, and keep the field of operation dry through out the operation. At its conclusion the dura should be closed with a continuous watertight silk suture so as to prevent leakage and the establishment of a cerebrospinal fistula, to secure proper coaptation in the muscular structures, three tiers of sutures should be used; the first, interrupted splint sutures to bring the belly of the muscles into apposition and provide proper protection to the spinal canal; the second, a continuous catgut suture in the sheath of the erector spinæ muscles



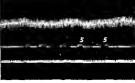


Fig. 6.

Fig. to (a) Showing effect on blood pressure of electrical simulation of ventral roots before application of sion am. (b) Showing negative results upon blood pressure of electrical stimulation of ventral roots after application of storain.

(Fig 9), and the third, in the stronger vertebral aponeurosis or aponeurosis of the latissumus dorsi muscle Through a stab wound, a drainage tube is introduced to provide for oozing and is removed in eighteen hours.

Whate the method of exposure and the method of closing the wound are matters of some moment, the intravpinal manipulations are obviously the most important, require the most delectedy conducted movements, and at the same time are pregnant with harmful oposibilities. While it has been said (though of the truth of this point I am not wholly con inced) that manipulations of the brain ipso facto do not create harmful impressions, it is undoubtedly true that trauma of the cord, and more particularly for the dorsal or overtall roots, is distinctly harmful. This is not a mere speculation, but is founded on clinical observations and is confirmed by

Crile's contribution to the etiology of shock, in which he has shown that the vasomotor center may be depressed, if not exhausted, by harmful afferent impulses. There could be no more potent method of so affecting the vasomotor center than the manipulations of the ventral roots attending some of these intraspinal procedures The identification of the roots in the cauda equina and the separation of ventral from dorsal roots undoubtedly have a damaging influence. On one occasion, particularly, while attempting to differentiate from one another the component roots of the conus, which is a rather tedious matter, the patient exhibited signs of serious circulatory disturbance which could be attributed to no other factor. It is important, therefore, to introduce into our technique something to safeguard the patient against the possible serious, if not fatal, effects of these intradural manipulations, and to this end, I have found that an effective block may be established by the application to the

cord just above the seat of the operation of a four per cent. stovain solution In repeating the operation upon an animal under full amssthesia, we found that without stovain the initial stimulation of the ventral root was followed by a transitory rise in blood pressure, but that after application of stovain, faradization of the roots had no effect whatnessever upon blood pressure, the stovain having blocked the passage of any impulse (Fig. 10).

With these precautionary measures, with the attention to the problem of anaesthesis, with the stovain block, and with due regard to other features of the technique already mentioned, we have come to regard the operation of laminectomy and the accompanying intraspinal procedures with little apprehension, and have so reduced the mortality as to place the operation on a par, from the standpoint of safety, with the exploratory cellotomy and many of the more common intra-abdominal procedures

PROCTOCLYSIS—AN EXPERIMENTAL STUDY¹

By HUGH II TROUT, M D., ROANGAE, VIRGINIA

A PRELIMINARY announcement of this experimental work was first reported February 12, 1012 Since this time the facts contained therein have been further confirmed by an increased number of cases, and more information ascertained A brief synopsis of this primary report is about as follows: The work started with the idea of comparing the effects of plain tap water as against normal saline solution per rectum, and this series covered nearly 1,000 cases

The present report contains a few over 2,000 cases. In other words, every patient who has an operation is given, by rectum, either tap water or normal saline solution. Of course, operations on the rectum and perineum have to be excluded from using prototolysis. With these exceptions this list contains a wast majority of all the operations of surgery and gynecology, and it is interesting

to notice by alternating the cases as they leave the operating room how evenly they are divid-

ed into different classes in the final summary.

The anæsthetics have been nitrous oxide

and oxygen, ether, chloroform, and cocaine The method of proctoclysis is the same as described by Murphy, except in the place of the hard rubber nozzle we employ a small soft rubber catheter and count the drops per minute by means of a visible dropper, first

described by Lawson (1)

We have not been able to introduce the large amounts of water, or normal sabne solution such as Murphy (2) reports (nine quarts in 24 hours), except in a few of our drainage cases and in patients whose resistant power was so lowered that the hard rubber plug was not painful. In the vast majority of our cases the presence of the soft rubber catheter was not even known to the patient

1 Read before the Southern Surgical and Gymenological Association December 18, 1919

Inquiry has been made of most of the larger hospitals in this country both as to the method of preparing normal saline solution as well as their reasons for using the same in the place of plain tap water for proctoclysis. Replies were received from 232 hospitals, and the manner of preparation varies from careful attention to the most minute detail and containing potassium, calcium, and sodium chloride in varying proportions, filtered and sterilized, to the simple placing of two teaspoonfuls of table salt to one quart of tap water. In other words, the replies show there is no uniformity in preparation, and in most of them the solution is not isotonic with blood A teaspoonful of salt may be anything from 115 grains to 270 grains, depending upon whether it is "heaping" or "level" or anything in between the two

Taking a series of tubes, each containing 2 cc of sodium chloride solution of strengths varying from 1 per cent to 5 per cent, and placing in each one drop of blood, we find hemolysis occurs very sharply at two limits, the lower being between 50 per cent and .55 per cent, the higher being between 11 per cent and 1 2 per cent Apparently hamolysis takes place at the lower limit by first liberating the hamoglobin, which is followed by the destruction of the cell; while at the upper limit there is first crenation and finally destruction of the cell. Mention of this is made simply to call attention to the fact of so many solutions being employed intravenously which are far removed from safe limits This statement is based on the replies from a number of hospitals, indicating the employment of the same strength solutions intravenously as by rectum

Following the directions of preparations given by the majority, and using the amount of fluid said to be absorbed from the rectum by many, we would be forcing into an already weak-need patient, in the space of 24 hours, the average amount of salt consumed as a condiment by a normal man in one month. Some replies contend salt solution is less irritating to the rectum, but we find the reverse to be true.

The vast majority of the replies indicate the necessity for a chemical similarity or isotonicity with blood. Of course, if osmosis plays any part in absorption from the rectum, which the majority of authorities deny, the higher the tonicity of the blood and the lower that of the solution, the quicker will the solution be absorbed. One reply suggested water might "dissolve out the salts from the cells of the epitbelium, which takes on water to such a degree that the cells themselves actually burst. Salt solution prevents this and is absorbed without any destruction of the epithelium " This theory is not based on any experimental work or proof of any We have now employed water in over 1,000 cases, and in no case have we been able to see anything to indicate a destruction or irritation of the epithelium

Even we surgeons know of the wonderful improvement in some patients with nephritis when placed on a salt-free diet, and all of us realize there is a transient renal irritation or possibly a nephritis following the majority of anæsthetics and infections In 7 cases in our series the following coincidence has been observed, a transient albuminuria remained in every specimen for two days after an anæsthetic when using salt solution per rec-Water was then substituted, and at the end of 24 hours the albumin had disappeared. At this time a return was made to salt solution, with the appearance of albumin and a few hyalin casts in from 6 to 24 hours. Patients were then placed on a limited salt diet. and the urine in every case promptly returned to normal and remained so until discharged from the hospital In none of these cases was there any ordema

An attempt was made to ascertain if there was any difference in either the time of appearance or amount recovered after giving a hypodermic of phenosulphophthalein (Koundtree-Cerberty method), after first obtaining what was apparently normal for that individual patient and then giving first water and later salt solution by rectum, and vice versa. In all our cases both factors remained practically constant, but our experience is far too limited to justify any final deductions on this point.

The estimation of the sodium chloride content, both in the blood and urine, presents too many uncertainties to be of any practical value

The association between sodium chloride and the kidneys is too well known to require further comment

Personally we believe surgeons have simply drifted into employing salt solution by rectum without giving any serious consideration to what they were doing and such is our excuse for this paper

In this entire series in both the salt and water cases there have only been 121 who complained of being thirsty and of this numher 112 of them were salt cases. There were 27 or over one fourth of these cases com planted of tasting salt, when they had absolutely no way to know they were being given saline by rectum, and the solution being prepared so as to be six tenths to nine tenths per cent sodium chloride | Lurthermore, the water cases have taken one third more fluid by rectum than the salt cases, and the latter have required nearly twice as much water by mouth to reheve thirst

In addition to this there have been 58 cases who have been previously operated upon one or more times in other hospitals and they have all commented without suggestion, on the absence of thirst and decrease in nausea which were the prominent leatures of the previous operation, from the patient's view Of this series, 32 were given water and 26 salt solution per rectum

During the time of this series there have been 287 operations upon the rectum and permeum which have been under exactly the same routine with the exception of not em ploying proctoclysis and with the exception of 5, they have all complained bitterly of thirst

We can see no more reason for the giving of salt solution by rectum to prevent and reheve

thirst than we can for its employment by mouth under like conditions, and furthermore, we have noticed that when given by rectum at sometimes produces the same nauseating and slightly toxic effects it does after drink.

ing There have been two cases reported in the literature which have terminated fatally by employing a strong stock solution of sodium chloride, carclessly substituted for the physiologic solution, and Evans (4) reports two additional cases in which death was actually produced by the use of the physiologic salt

It is true sodium chloride is the least toxic of the group of similar metal chlorides, but even at that it is a poison to all people when given in large do-es and occasionally very toxic in small doses to a certain class of cases: and we believe this peculiarity is apt to be present in patients whose resisting powers are lowered by operations and infections.

Certainly our observations convince us this is not only a theoretical but a most practical fact, and one worthy of more consideration than his been usually given to it in the past

Finally we know the giving of fluid by rectum meets Nature's post operative demand for the relief of thirst in a simple, effective and harmless manner, and to those of us who have been operated upon no other comment is necessary, to those who have yet to be operated upon, let us hope they will be spared the usual appeals for water, by insisting upon the employment of proctoclysis

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THE PRESENT STATUS OF THE RADICAL ABDOMINAL OPERATION FOR CANCER OF THE UTERUS¹

By REUBEN PETERSON, M. D., ANN ARBOE, MICHIGAN Professor of Obstettics and Generalogy University of Michigan

N the whole it can be pretty definitely asserted that the radical abdominal operation for cancer of the uterus has never been and is not now commonly performed by American surgeons cannot be claimed that our operators are either less skillful or less intelligent than surgeons in other parts of the world, perforce there must be another explanation for the failure of the operation to become popular in this country It will be the purpose of this paper to look at the question from a number of standpoints. with a view of determining the reasons for the unpopularity of the operation, with a plea for a change of conditions, so that the operation under consideration may be more universally For in spite of the discouragement which comes from not being able to make the primary and end results of the radical abdominal operation for cancer of the uterus all that could be desired. I am still a firm believer in the operation, which I perform whenever the opportunity arises, in prefer ence to other methods of treatment

The principal reason for the unpopularity in this country of the radical abdominal oper ation for uterine cancer is its high primary mortality Surgeons are not accustomed, in these days of highly perfected technique, to a primary mortality of from twenty to fifty per cent, which would be a fair estimate of the mortality of the radical abdominal operation, if all reported and unreported cases could be collected Surgeons necessarily must be content with such a high mortality in emergency operations neglected cases where the knife holds out the only hope of saving life Under such circumstances the surgeon consoles himself with the thought that without operation it is sure death for the patient within a few hours or days, and that every life saved is so much gain. However, it is different in the case of the woman with cancer of the uterus, who is able to walk to the operating room.

Such a high primary mortality as has been mentioned in such cases dismays even the most unemotional surgeon, and makes Jum query if after all he is justified in continuing with an operation which carries with it such disastrous primary results If to this doubt be added a secondary mortality by no means low from a recurrence of the cancer, it is not to be wondered at if the surgeon abandon the operation upon what to him seems logical grounds and returns to the safer palliative procedure I am firmly convinced that, for the reasons set forth above, the personal equation has had much to do with the abandonment of the radical abdominal operation for uterine cancer by American operators. And until two things have been brought about. I believe the operation under discussion will not be generally adopted First, the profession and laity must be so educated regarding uterine cancer that the disease will be recognized earlier and patients come to the surgeon when local and general conditions combine to bring about a low primary mortabty Second, for this particular operation true specialization must result, so that the occasional operator will be eliminated.

The profession has been singularly backward in mangurating the campaign against carcinoma It has held aloof for a number of reasons, prominent among which has been the uncertainty as to the value of the knife as a means of cure. This doubt on the part of the great body of physicians has its origin in the poor surgical results obtained two or three decades ago from imperfect or incomplete operations, where the local disease was not entirely removed A so-called recurrence after an amputation of a breast for cancer when the avillary glands are not removed in reality is not a recurrence but a continuation of the disease. The same will apply to cancer wherever situated. But no matter how faulty the reasoning, once let an idea become firmly fixed in

the mind of the medical body politic, there it sticks until dislodged by long and continuous efforts on the part of those who have had better opportunities for judging the true condition of affairs

The pertinacity with which the profession clings to a totally wrong medical conception is illustrated by the erroneous ideas regarding fibroid tumors of the uterus even now existing to a certain extent For years it was taught that it was best to tide the woman with a fibroid tumor over the menopause, in the hope that all symptoms would cease after the cessation of menstruation. Time has shown this hope to be without foundation in the large majority of cases. Not only is it true that usually the growth does not shrink nor other symptoms such as jucreased flow cease, but the woman is exposed to other dangers even more serious, such as carcinoma of the body of the uterus Yet so firmly was this idea of the beneficial action of the menopause upon uterine fibroids fixed in the minds of the profession, and through them the public, that many a poor woman's life is jeopardized even at this late day through adherence to this faulty treatment.

Hence, first of all we ourselves must be convinced that cancer is a local disease and captable of eure if taken in time, and radically removed. Otherwise we can naver loope to convince our pattents and the public in general

that there is any cure for cancer That this surgical association and others of a similar nature have not long ago united in a campaign against cancer can only be explained upon the basis of there being something which has prevented surgeons, as a body, from beginning the attack. What are the reasons which have held us back when we have seen the great benefits resulting from the antituberculosis campaign. It could not have been that we minimized the importance of cancer in its various forms, for we have known for some time that in certain communities the death rate from eancer exceeds that from tuberculosis. Nor could it have been because we have not had opportunities of seeing and studying the disease, for from the very nature of the case, the surgeon sees sooner or later the vast majority of patients suffering from

cancer. Our hesitancy to inaugurate a cancer campaign is probably due to the fact that, unlike tuberculosis, the cause of cancer is still shrouded in mystery, and for that reason we are not in as good a position to enlighten the public as to how the disease is to be avoided. That this is true can be indirectly demonstrated by considering what would happen should the cause of cancer be discovered within the next month Within six months there would be inaugurated a campaign against the disease fully equaling if not surpassing the crusade against tuberculosis. The medical and lay journals would be filled with matters pertaining to the subject, and people would be taught how to avoid this disease which for so many years, in the public mind, has meant sure death for its possessor

As a profession, we certainly have been remiss in not doing what we can to mitigate the ravages of cancer. While not abating a single effort to ascertain the cause of the disease, surely it is our duty, individually and collectively, to save by early diagnosis and by surgical means as many of the victims of cancer as we possibly can Let the people be taught the early symptoms of carcinoma of the uterus, and the results of the operative treatment would seen be improved. If cancer at first be a local disease, as most of us believe, there must be a time when local treatment, even without glandular removal will result in cure The impossibility of determining from appear ances or macroscopic examination just how long the smallest cancerous lesion has existed, or just how far it has extended, will always stand in the way of our remaining satisfied with anything short of radical removal of the disease. But the radical removal because of the possibility of extension discoverable only through the aid of the microscope, and removal where the gross appearances indicate that the cancerous process has attacked the surrounding tissues, are entirely different Radical operation under the former conditions can be so perfected as to insure an exceedingly low primary mortality and excellent permanent results; in the other class of cases the primary mortality must always be high and permanent results poor on account of recurrences.

Thus, the present status of the radical

operation for cancer of the uterus, at least in this country, is directly dependent upon early diagnosis of the disease under consideration. In my opinion, unless patients can be operated upon earlier, we have about reached the limit of what can be accomplished by the operation, except as the primary and end results may be improved somewhat as the technical skill of individual operators be in-This statement has reference to the creased percentage of absolute cures which is the reduction to one figure of the ratio between the number of cases of cancer of the uterus seen during a given period and the number of patients operated upon by the radical abdominal method who are alive and free from recurrence after five years Winter has reduced this to a formula $\underset{joo}{O \times D}$ where O

denotes the number of patients operated upon out of 100 seeking relief and D denotes the number of patients remaining healthy out of 100 operated upon If then in this country we have almost reached the limit of what can be accomplished by the radical abdominal operation for cancer of the uterus, or in fact by any operation with the cancer material as it is at the present time, the only way the percentage of absolute cures can be raised as by increasing the value of O or the number of patients with cancer of the uterus we are able to operate upon by the method under consideration.

Under the more enlightened conditions of cancer education prevailing abroad, it has been possible to obtain from 20 to 30 per cent-of absolute cures of the total number of patients with cancer of the uterus seeking relief. Stated in another way, this would mean that one out of every four women with cancer of the cervix seeking relief can be subjected to the radical abdominal operation, and will be free from the disease at the expiration of five years. That surely is something to be striven for when one reflects upon the small number of patients he has been able to save out of the total number he has seen in a given number of years.

In other papers I have gone into the various aspects of the radical abdominal operation for cancer of the uterus. I have reported my results carefully, my successes and failures. Others have done the same, so that there is now an extensive literature upon the subject. To the unprejudiced mind it has been demonstrated that cancer of the cervix can be cured in a considerable percentage of cases provided the patients are seen early enough and the operation is sufficiently extensive But the fact remains that our results in this country, both primary and permanent, are exceedingly poor, and that it is time we began the campaign of education on carcinoma in general, and, because of its great frequency, cancer of the uterus in particular. While primarily this paper is a plea for the necessity of early recognition of cancer of the uterus, in order that the status of the radical operation may be improved, it seems to me it is the duty of this society to broaden the campaign so that it will include all kinds of carcinoma which can be benefited by surgery In other words, I would have this society, through a committee appointed at this meeting, devise some plan by which it would be possible to secure cooperative action upon this question by all the special surgical and gynecological societies in America, including the surgical and gynecological sections of the American Medical Association After the whole subject has been thoroughly gone into and the plan of action determined upon, it will be a very easy matter to interest the various state societies in the question. Just how the matter should be worked out is not particularly important here, The main things to be emphasized are: the poor results now obtained in the operative treatment of carcinoma, the possibility of improving the results of such treatment by earlier recognition of the disease by both the profession and the laity; the necessity of inaugurating a campaign of education on carcinoma through committees from the various national surgical and gynecological societies; and finally the desirability of having this society be the pioneer in this movement.

DEPARTMENT OF TECHNIQUE

SOME OBSERVATIONS ON THE ANATOMY OF THE INGUINAL REGION, WITH SPECIAL REFERENCE TO ABSENCE OF THE CONJOINED TENDON

BY WILLIAM HISSI RT. M D. CHICAGO

"VLN a cursory examination of the voluminous literature which has accumulated on the subject of inguinal herma would seemingly convince anyone that in this branch of surgery the list word has been spoken. The anatomy is well known and classically described in the current text-books. The pathology has been amply described, and the etiology is general-Is admitted in be bised on the presence of a congenitally preformed sac. The technique has been made more uniform and 14 guided by certain broad underlying principles. It would seem, then, that there is no phase of the subject of bernia which has not been amply treated by the ablest of writers. Yet this is not strictly the case, for there is a matter of anatoms, generally slighted which in my opinion is worthy of special mention I refer to the question of the presence or absence of the conjoined tendon of the internal oblique and transversalis muscles

In the prevailing text-looks on automy the conjunct tendon is described but not accorded much prominence. Here and their it will be stated incidentally that the tendon may be absent. Reference to the more important works on surgery, and monographs on herial fails to hot much information regarding the conjuned tendon the fact that sometimes a write will furthy mention the fact that sometimes the tendon is absent. Thus empression is gained that such an anomals at absence of the conjuned tendom may occur, but has no practically significance.

has no particul significant with the convertion by experience has destinged the convertion that absence or maildest forment of the component tendors is not a few particular to the component tendors in the particular tendors in the particular tendors and the subject, the particular tendors are the subject to the particular tendors are the subject to the subject to the particular tendors are the subject to the subj

(Read before the Chkago furgical Society January so, 201)

inguinal region. The inguinal canal is about a can in length and runs from the external to the internal abdominal ring. The external ring bare by admits the tip of the index finger, it lies insuchately to the outside and above the spine of the public it is formed by a splitting of the there of the external inhance aponeurosis into two columns or pulley. The internal ring is about michary betaset the anteroscuperory of

of the flum and spine of the pubis

The incumul canal has an anterior and a posterior nall, a rool, and a floor. The anterior wall is formed by the aponeurous of the external oblique and by the internal oblique for about its outer third The internal oblique and transservals muscles arree in the male from a little more than the outer half of Pounart's ligament, sometimes even from the outer two thirds. In the female the origin is more regularly from the outer two thirds. In some individuals the muscle an-e from the outer third of the ligament, thus affording no support to the internal ring, a point emphasized by the lite Dr Ferguson The posterior wall of the canal is formed by the transversalis lascia and at its outer median portion by the conjoined tendon. The roof is formed by the arching tibers of the internal oblique and transpersales muscles, and the floor by the shelp. me portion of Founart's heament

The conpoined tendon is formed by the apneuros- of the transversals, together with the more midal lower portion of the internal oblique, there two larves of larvas uniting in this region to form this so-called conjoined lendon, which is merred into the hold and supernor rams of the pairs. Medailly it is especially incharged to supernormal to the control of the rectue.

By closely observing the anatomy of this region during the performance of herma operations one will soon be consinced of the frequency with which deviations from the normal occur. The tendon is sometimes narrowed and poorly defined, more commonly it is entirely absent. In this case the fibers of the internal oblique and transcreasily assigned in the case the fibers of the internal oblique and transcreasily assigned in the case of the rectus without forming any tendinous union. The lower portion of the muscles as they passing ward will be often found much thinner than normal, and there may even be spaces between some muscle bundles exposing the transversalis fascia beneath.

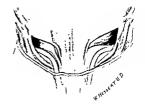
Thus there is formed a triangle whose apex is at the internal ring, the sides being formed by the internal oblique and transversalis muscles and Poupart's ligament respectively, and the base by the edge of the rectus. The floor of the triangle is formed by the transversalis fascia. This area is a very weak spot in the abdominal wall, for it is covered, and but partially so, by the lascia of the external oblique I am inclined to the opinion that in cases where the tendon is deficient there will be found other evidences of maidevelopment, such as an atrophic condition of the fascia of the external oblique This structure is sometimes very thin, almost transparent, and in the region of the external ring the fibers split up and separate so as to form an abnormally large onening

If the conjoined tendon is absent, to what extent might this predispose to direct or indirect bernia?

I fully endorse Coley's statement when he says, "At present we are beginning to appreciate the fact that the great predsposing cause in all inguinal and practically the majority of femoral heritas is a congenital or preformed sac, and on the basis of this, the first and essential principle of a radical cure must be the thorough removal of such a set." Writers differ somewhat in their description of what they consider a predsposition to liquinal herital. A potential bernal sac of congenital origin is always a predsposition, but cannot be detected clinically.

My conception of a "predisposition," which the Germans call "warch Leste" or "Bruchanlage," is as follows. Clinically the external ring will be found very large, and the cannal will admit the finger for a considerable distance. There is felt a distinct impulse on coughing or straining, and by saceping the examining inager up and down with its palmar surface turned towards the median line, the absence of the conjoined tendon can readily be determined, and in its stead the blunt edge of the rectus is felt.

I deem it justifiable to operate both sides in patients who present a fully developed hernia on one side and a "Bruchanlage" or weak groin on



The disstration shows the inguinal tanals exposed by optiming the fibers of the external oblique fastia and retracting the flaps. The right side presents the condition normally found anarely, as well defined conjuned lendon normally found anarely, as well defined conjuned lendon of the control oblique and transversals are seen to goes detect its marked to be instead this by on the rectus and no conjuned tendon is formed. This deposition of the muscles' creates a transplate apace whose base is he testis, and whose sides are formed by the internal oblique that space is formed by the material clause.

the other Where this had not been done, I have had patients come back after several years with a real herma on the other side, proving that the diagnosis 'predisposition' was well founded. What is the anatomic structure of the parts

when we operate these so-called cases of 'predisposition'.

The external oblique fascia is thin with separated fibers and a very large external ring. On slitting up the fascia and exposing the inguinal canal, the absence of compoined tendon is verified. The fibers of the internal oblique and transversalis muscles are inserted high up on the rectus, forming a wide "inguinal interspace" The muscles themselves are likely to be weak and attenuated. In addition to this there will occasionally be found a remnant of the unobliterated tunica vaginalis in the shape of a potential sac Lastly we may find a sac, congenital or acquired, admitting bowel or omentum, showing that the supposed predisposition was a real hernia after all. It is freely admitted that a person presenting what would clinically be called a predisposition can go through life without ever acquiring a herma, just as a man may die in old age, the possessor of a congenital potential hermal sac which never developed into a hernia.

There can be no doubt that the development of a direct hernia is favored in those cases where the conjouned tendon is absent. The trangular area before mentioned, supported only by the transversalis fascia and partly by the aponeurosis of the external oblique, is a very weak spot, pre-enting conditions favorable for the formation of a hernia.

Is the recognition of this anomaly of absent conjoined tendon of any practical importance?

I think it is a practical question in its bearing on our operation technique. Our choice of operation should be determined by the anatomic findings. We have all seen cases in which it would have been impossible to perform a typical Bassian operation. Owing to the absence of conjoined tendon and the high insertion of the muscles into the rectus, the former could not be brought down to Poupart's ligament without creating too much tension. Either the suture would tear through the muscle at once, or necroes would occur later. Our attention has been called to the necessity of making the closure of the canal at its pulse end especially firm. Any weakness there will predignose to the recurrence of the herma.

The technique which is best adapted to meet the requirements of these cases is the imbrication operation of Andrews By bringing down to Poupart's ligament the edge of the fascia of the external oblique and as much of the muscle as possible, a very firm covering for this neak area is secured, which is further fortified by the overlapping of the lower flap of facea. In cases where the triangle is especially large or the extrapolation of the lower flap of the control to the food of service. By incising the edge of the rectus sheath, the muscle fibers are evposed and a portion of the muscle fibers are evposed and a portion of the muscle can be brought down and sutured to Poupart's lagraent, thus supplanting the conjoined tendon which is absent. The operation can then be completed after the Andrews metals.

CONCLUSIONS

 The conjoined tendon is deficient or absent more often than has been generally observed.

2 This anomaly supplies an important predisposing factor in the development of direct hernias, and probably plays a certain rôle, though a minor one, in the ctiology of oblique hernias.

3. The presence of this defect precludes the performance of the typical Bassini operation,

except possibly in children.

4 The Andrews imbrication operation best fulfills the indications, regardless as to whether the tendon is present or absent. The Bloodgood transposition of the rectus will be found useful in certain cases.

PRELIMINARY REPORT UPON THE USE OF INDIGOCARMINE INTRAVENOUSLY AS A TEST OF THE RENAL FUNCTION

BY HENRY DAWSON FURNISS, M D. NEW YORK CITY

THERE is no doubt as to the value of indigocarmine in estimating renal function. Imming the relative sufficiency of the kidneys after making a total estimate with phenoisalphonephthalem. The great drawback has been the pain attendant upon the intranse-cular injection of the occ of the o4 per cent solution, and even when we prevented this by the previous use of a local anest heite, there is a blick he solution was placed. Another objection is the vanable time of appearance of the drug in the urine, consequent upon the variable time of assertion.

To obviate the above difficulties, I recently began the use of the drug intravenously in a strength of 0 3 per cent and in amounts varying from 50 to 0 cc. I have seen no different in the time of appearance whether I used 50 to 0 cc. The beginning of elimination has been noted by observe, and this has ranged from two to six munites, with an averaged three and a half. While I have as yet made no estimate of the amount dimmated has the property of the service of the service of the certed in the first fifteen or twenty munites, as after this time the color of the drug has almost entirely disappeared

No local pain nor systemic disturbance has

been noted.

One of the cases in which we have used the indigocarmine both intramuscularly and intravenously, and have also a phenoisulphonephthalein estimate, is of interest. 20 cc. 0.4 per cent soil indigocarmine intramuscularly, appearance

19 min , 6 cc. 0 3 per cent sol indigocarmine intravenously, appearance 2½ min.; .06 gr. phenol-sulphonephthalein intravenously, in first 15 minutes 60 per cent

Had I depended upon the first test, I would have been led to believe there was some degree of

renal insufficiency.

More cases will be studied, taking into consideration the amount of the drug needed for best results, the time of appearance, the percentage of elimination in a given time, and the dura-

tion of excretion. Using the same patients a comparison will be made with tests with phenol-sulphonephthalein

While the nulbere, I consider the intra-enous method of administration preferred to the patient, and in give prove satisfactory and more uniform results by eliminating the Lactor of a variable time of absorption from the

VASOSTOMY-RADIOGRAPHY OF THE SEMINAL DUCTS1

BY WILLIAM T BELFIFED, M D, CRICAGO

A GENERATION ago pus tubes in the female were virtually unrecognized, discharges from the uterus were assumed to originate in that organ and were treated accordingly To-day pus tubes (seminal vesicle and vas) in the male are still generally unrecognized, chrome purulent discharges from the urethra are assumed to originate in that canal and are treated accordingly.

Several years ago I devised and described? the irrigation of vas and vesicle through an incision in the scrotal vas (vasostomy) whereby the entire genital duct, from epididy mis to urethra, can be medicated with any suitable solution Experience with this procedure has shown (1) that many cases of gleet, incurable through treatment of the urethra (because the discharge proceeds from the vesicles) can be thus cured, (2) that vas and vesicle may discharge their contents into the prostatic urethra not merely by ejaculation but also by unperceived peristaltic contraction - a function which explains some cases of mysterious pyuria, hæmaturia, phosphaturia, and transient albuminuria without disease of kidneys, bladder or urethra, that, in fact, the bladder may be a reservoir for the seminal as well as urinary ducts, (3) that toxemia may proceed from chronic infection of the seminal vesicle by the colon bacillus as well as by the gonococcus, (4) that obstructions to the passage of spermatozoa from testis to urethra, causing sterility, are frequent in the vas and ejaculatory duct

More recently I have utilized vasostomy as a means of radiographing was and vesicle, which are thus filled with a collargol solution. These

Vasa vesicles and ejaculatory due is filled with 10 per cent collargol solution, sidelled calbeler in right ureler Radiogram by Mr Ball Presbyterian Hospital, Chicago (Gonococcus infection of vesicles)

radiograms reveal, among other items: (2) the occasional transformation of the infected vesicle into a pus sac, or pyo essculosis, (2) the possible obstruction of the ureter, with consequent kidney symptoms, by an infected vesicle—a condition discovered through operation by Morgan, and by Young ⁴

*Ann Surg Phila 1901 p 528 *Ann Surg Phila 1903 p 650.

A CASE OF COMPLETE ANTERIOR DISLOCATION OF BOTH BONES OF THE FOREARM AT THE FLBOW

In KANDDER WASHOW, W.D. IL D. BALTIMORE
Professor of Suggrey in the Computing Marrial

BOY, aged 6 years, was earrying a bucket idled with water along a path, when he tripped on a stick and fell on his right shoulder in soft earth, and on his right elbow on the heaten path. He was brought to University Hospital after the lapse of three days. When seen by me there was much swelling and brawnmess of both arm and lorearm. A small mosable mere of hone or cartilage could be felt back of the ellow joint, the encountyte could be pulnated and a sharp edge of hone could be distinguished in front of the joint. The right forearm was 13th inches in length and the felt rt inches. The forearm was semiflexed and directed toward the inner side, and it was somewhat movable under anxithesia. The saugraph showed both bones of the forcarm to be entirely in front of the humerus, and a slight sliver of bone apparently torn from the lack part of the ofecranon proces. The lower humoral epiphysis also appeared to be partially separated from the shalt Reduction was effected, under ether anasthesia, by plicing the forearm in acute the tion and touching strongly downward. The hones returned to their natural position and the movements of the joint were easily executed The X ray showed the reduction to be complete and the sentrated mese of hone to be in normal contact with the electanon

Though my experience with dislocations at the ellow has not been extensive, it has been my fortune to meet with two varieties of great rarity;

A case of complete outward dislocation of both radius and ulna, reported in the Amelia of Surgery in May, 1000, of which, according to Stimeon, about 25 cases have been recorded.

The case of complete anterior dislocation related above. This is also a very rare condition and, according to Stimeon, "The number has not yet reached twenty-five, even including even cases in which the objection was broken off and

remained in place." Anterior di-locations usually occur in the young, and they are frequently compound. They are often associated with Iracture of the olecranon process, but such cases should be excluded from this category, as the olecranon fragment remains pesteriorly and only the broken anterior portion is displaced forward. This dislocation occurs in an incomidete form when the tip of the olecranon remains in contact with the under surface of the humerus It is said to be complete when both liones of the forearm be entirely in front of the lower articular surface of the humerus. Of necessits there must be extensive laceration of the lateral ligaments of the joint, and probably the tricens tendon is torn away from the bone There is frequently a designion laterally of the bone of the forearm. In the case herewith reported the forearm was directed towards the

The mechanism of the production of this



Fig. t. Complete antenor dislocation of both bones of the forcarm at the class before reduction



Ing a Mer reduction

dislocation is not well understood Probably most cases are due to a blow or fall upon the acutely flexed elbow, but some are undoubtedly the result of a fall upon the palm of the hand. In at least one case the injury was caused by traction on the extended forearm

Of the cases reported, one came to autopsy, three were subjected to amputation, and several, being compound, were open to inspection Doubtless the skiagraph will reveal a larger proportion of these dislocations than has hitberto

been suspected

The symptoms ought to be quite distinctive, but as swelling occurs promptly the bony points are soon obscured and it may be very difficult to determine the nature of the injury without an X-ray examination. The limb is usually semiflexed and the forearm somewhat lengthened, the electron is seen to be absent from its usual position and the lower end of the humerus can be palnated The olecranon process can often be felt in front of the humerus, and the head of the radius may also be palpated at times. The course of the uncomplicated cases appears to have been fairly satisfactory, but the compound dislocations generally suppurated and were either amoutated or resulted in impaired function

Reduction can usually be effected by flexing the elbow and pushing the forearm downward and backward In some cases reduction has been accomplished by passing a band around the upper end of the forearm and pulling downward while pressure is made on the humerus to force it forward Reduction has also been effected by bending the flexed elbow around the knee of the

operator of the arm of an assistant

PERIRENAL HEMATOMA

BY HORN SPEESE M D PRILADELPRITA

Instructor in Surgery and Surgical Pathology in the University of Pennsylvania

LTHOUGH perirenal hæmorrhage was accurately described by Wunderheh in 1856, the affection remained unknown until 1907, when Doll's contribution to the subject was made Since then numerous cases have been recorded and the nature of the affection well established The history of an additional case may be of value, especially as the subject has been limited largely to French and German reports The operation was performed by Dr Edward Martin, to whom I am indebted for permission to report the case

A G aged 43 fireman married, father of four children, who are living and well. Has had gonorrhera, but denies lues Was entirely well until two days before admission to the hospital (March 3, 1912), when after exposure to extremes of cold and heat, he developed a chill which was followed by profuse sweating He demes having sustained any injury in the kidney region He retired at night com plaining of malaise, and the following morning of aching in the arms and legs. Urine contained albumin, a few hyaline casts, and a moderate amount of red and white blood-cells Blood hæmoglobus 75 per cent, red blood cells 3,950 000, white blood cells r6,200 llis condition remained about the same until March ro, when he complained of pain which radiated from the right hypochondrum to the lumbar region, where a tender mass was found on palpation

March rs, rgra, patient still complained of pain m right kidney region, where a decided fullness was present, extending 3 cm below the costal border, painful on pressure and movable on himanual palpation. Patient was very much prostrated pallor was marked, pulse rapid, temperature tor Urine 1023, acid, albumin abundant granular casts, fen Jeucocytes, no red blood cells leucocytic count rougo March 14, 1912, examination of faces for blood negative White blood cells 25,700 Chromo-ureteroscopy and ureteral catheterization by Dr. B. A. Thomas was as follows Bladder was slightly more capacious than normal and showed trabeculous hypertrophy. The prostate was slightly enlarged and the ureteral orifices normal Catheter No 6 passed 15 cm up both ureters, and urine, safron yellow in color, was collected for physical, chemical, and bacteriological evamination. The elimination was about twice as much from the left as from the right side,

mine left-13 mm (light blue), right-trace in 20 min Examination of catheterized specimen of urine from ureters Right ureter -amount 1 cc , amber, cloudy sediment, no casts a few red blood cells, no white blood cells, a few round granular epithelial cells, no crystals, no tubertle bacilli Left ureter amount 5 cr , amber, cloudy sedment, no red blood cells, an occasional white blood cell, many small round epithelial cells, no crystals, no tubercle bacilli

both sides climinating less than normally Indigocar-

March 17, urine showed florculent sediment, specific gravity 1020, acid, no albumin or sugar No casts, no red blood cells, few white blood cells, a few squamous epithelial cells, no crystals Blood hæmoglobin 65 per

cent, red blood cells 3,810,000, white blood cells 23,500 March 19, as there was some doubt about the diagnosis, an exploratory abdominal operation was made and a retropentoneal mass apparently connected with the right kidney was revealed The abdominal wound was closed, and the

Read before the Academy of Surgery of Philadelphia November 4 2012 From the Laboratory of Surgeral Pathology, University of Penn-



kiling a speed to limbar moves. The entire fatty and the record of the speed of the speed of the model of the speed of the speed of the speed that the speed of the speed from the kolmes a speed of the speed of the speed from the kolmes and was addrered to the fatty capsule, which was a straight of the speed of the speed of the 3 cm. in length and illied with congulated blood. The process was required a speedably melanom another kindle, was catiguided as possible buildensian and the latter of the speed of the speedably speedably melanom and the latter of the speedably speedably melanom and the latter of the would showed with framenge. Over allowing the

The patient developed an infection is the personal pace which thild not complicitely subside for everal weeks, the sunses slosed nine weeks after the operation. The time of his desk-time from the hospital was normal in amount but contained a slight amount of albumin and a few cysts.

Pathological examination The specimen consisted of a kalney and fatty cap-sule, the organ measuring 13 cm, in length by 8 cm in breadth It was intensely had morrilagic and showed the presence of many blood clots on the surface. At one point, about the center of the organ, was an oval rupture measuring 4 x 3 cm, extending from the dorsum almost to the hilus, containing a mass of friable tissue and blood tolt. The fatty capsule measured about 20 cm, in length by 13 cm, in breadth, was enormously thickened and was filled with 1-tmorrhagic extravastion. The inner lining of the fatty cap-ule was smooth and exidently represented the throus capsule, which had been separated from the kidney. Several large rents were present, through which soft blood clust projected. Section through the kidney through whose mentioned area of rupture showed grossly an apparent crosson of the kidney through by the blood mass.

Micro-copically, the Lidney tissue itself was the eat of cloudy swelling, obliteration of many glomeruli, an excess of connective tissue and thickening of the blood-sevels. Toward the perplicity of the kidney and directly in contact with the blood clut, beginning organization of the latter was present Small areas of necrosis and a few clumps of leucocy tes were seen in this region. but no distinct inflammatory reaction was noted The mass of tissue surrounding the klilney, which has been described grossly as the fatty capsule. consisted chiefly of blood clot and faity tissue Throughout the blood clot were numerous newly formed capillaries. The process of organization appeared to be somewhat further advanced here than in the clot in the kidney itself

On the inner surface of the fatty capsule a delease abrous stroma representing the detached introduced pulse was present. The bloodyness contained within it were normal in appearance, there was no explence of pathologic change in the tissue.

Sections through the renal vessels and preter showed a normal appearance

The process was regarded as a peritenal humorhage, secondary to chronic interstitial neightis, the only pathologic feature demonstrated. The minute areas of metrosis were produced by presure of the chot rather thin by infection, because the inflammatory nature of an infectious process was entirely wanting

Tenernal bamorrhage may be traumute in organ and follow contubions or other injuries in the ladicy region, or result from tubercules; thmore, harmophilis, calculue, or explic processes in the cortex of the kidney. The evplanation of hematomata of traumatic, hemophilic, or neoplastic origin is easily made. In those cases of sonataneous hamorrhage with the capsule in lact, or in which the hamorrhage appears leven the ladic band of the processes of the ladic of the ladic l

Runture of a renal blood-vessel has been sug-

gested as a possible cause of the hæmatoma, but this seems unlikely, as a bleeding point has not been discovered at operation, and search for a regulared artery or vein in the operative or postmortem speciales has been unsuccessful. The histologic examination of the kidney in the operative cases, and the urinary findings in other instances, show that chronic nephritus is other instances, show that chronic nephritus is constantly present in spontaneous pericenal hæmorthage.

Inflammation of the kidney parenchy ma gradually extends to the fibrous capsule which becomes thickened. The exact manner in which the hæmorrhage develops is not clear, whether traumatism so mild as to be overlooked may rupture a small arteriosclerotic vessel and give rise to the initial bleeding, or whether it is a chapedesis incidental to vasomotor disturbances, is a question. As the hæmatoma enlarges, the capsule is gradually stripped from the kidney, rupturing the small vessels between the organ and the cansule. and thus promoting fresh hæmorrhage pressure everted by the clot is sufficiently great the kidney may be eroded, rupture of the capsule follows, the blood infiltrates the fatty capsule and gradually extends to the retroperatoneal tissues When a spontaneous hæmorrhage occurs in the fatty tissues about the kidney and the fibrous capsule is intact, the hæmorrhage is believed to occur from diseased vessels in either capsule, for both undergo thickening and degeneration in chronic nephrlus, or the blood is derived from a source other than the kidney

While chronic inflammation of the kidney plays an important produposing role in the devolution an important produposing role in the devolution of perincul effusions, as it does in essential harmaturia, the cases in which ulceration or rupture of the cortex occurred point conclusively to the kidney as the source of the hemorrhage. This was noted in Doll's second case, in which are in the capsule and cortex was found, and in the author's case, in which even a larger rupture was present.

Coenea, from his observations, concludes that the ladney is the source of the hamorrhage, for the following reasons: (1) the anatomical position of the effusion, (2) the frequent occurrence of tears or ruptures of the fibrous capsule, (3) infarction of the fibrous capsule, (3) infarction of the fibrous capsule in some cases, (4) the occurrence of perirenal hamorrhage in tuberculosis and tumors of the kidney.

Ricker, on the other hand, believes the hemorrhage is derived by diapedesis from the vessels of the fibrous capsule, brought about by insufficient stimulation of the vasoconstrictor nerves. As his case had an associated lesion of the central nervous system to account for the vascular disturbance, it is impossible to apply his theory to other instances in which such lesions were absent.

All hæmorrhages into the retroperstoneal tissues do not arise from the ladney or the perirenal tissues. Koch observed a case presenting typical symptoms of a perirenal hæmatoma, the hæmorrhage being derived from the adrenal gland, which was both hæmorrhagie and necrotic. It is of interest to note that the same symptoms content to the third that the same symptoms and by rupture of the epigastric artery into the sheath of the rectus musicle (Michaux).

Perirenal harmorrhage, therefore, is due to many factors, it results from diseases of the kidney (tuberculosis, tumors), harmophilia, adrenal harmorrhage, and in certain cases is spontaneous, apparently being predisposed to by chronic nephritis

The development of hæmatomata of perirenal organ is accompanied by symptoms which are so characteristic that the diagnoss should be made without difficulty. The three chief symptoms emphasized by Lenk are sudden and severe pain in the kidney region, the indications of internal hemorrhage, and the development of a retro-perstoneal turns.

Pain is the first symptom noted, and is frequently followed by nausea and vomiting. In the majority of cases the pain occurs at intervals of days or weeks, each attack being the indication of a fresh hæmorrhage, in a few instances the pain has been constant in character. The pain radiates from the kidney toward the lumbar or sacral regions, the back, hip, or the shoulder Generally there is a tendency for the pain to localize itself in the region of the affected kidney, but sometimes a diffuse tenderness may persist. The pain is due to pressure on the kidney capsule, which contams a rich nerve supply, and is explained in the same manner as is the pain in renal hæmaturia accompanied by colic, in which there is no demonstrable obstruction to the ureter by a clot or other foreign body In these cases the sudden increase in intrarenal pressure incident to acute congestion and swelling of the kidney, and the subsequent distention of the fibrous capsule with pressure on its nerves, is held responsible for the colic-bke pains

The symptoms of internal hæmorrhage, next to part to the most importance in the diagnosis of perirenal hemorrhage. The bleeding is frequently accompaned by shock, which may appear during the intial attack of pain or later. The pallor and shock are due to loss of blood and to reflex nerve disturbance. After several attacks, each accompanied by a Iresh hamorrhage, a secondary anamia develops.

The studion of the hematons is a matter of extreme interest and importance in explaining fit origin. In 5 of the 21 cases the hemorrhage cocurred between the kidney and its capule, so that the latter was detached and became adherent to the fatty capsule. In 6 of the remaining cases the capsule was ruptured, and the coagulum surrounded the kidney and inflirated the fatty capsule and retroperitioned tussue. In the remaining cases, in which the harmorrhage was derived from the kidney, the capsule was reported as intact, although the seat of chrome inflammatory chances.

change. The harmatoma occurs in the form of a blood cyst, the walls of which are formed by organization of the clot and by the surrounding itsues. The contents may be fluid to a large ettent, or the blood may be precent in layers due to the organization of recurring harmorrhages. In some cases before organization and the coloring matter may then occur, and finally the coloring matter may then occur, and finally the conjumn's converted into a clear collection, and its harmorrhage character only recognized by mitute remnants of clot in the wall (Koch). It is blichy that some of the so-called perirenal cysts orientated in this manner.

The hamatoma is usually large, extending from the diaphragm to the pelvis and to the midline anteriorly, and varies from the size of a child's head to tumors several times this size. The contents have been estimated at 15 liters (Hildebrand), two pints (Fratier), and by others have been described as large masses of fluid and coagulated blood As the hæmatoma enlarges, the abdominal resistance and tenderness increase, so that the exact size and nature of the tumor is The hamatoma often difficult to determine usually appears soon after the onset of pain, and attention is directed to it by the localization of the pain in the kidney region Occasionally the mass diminishes in size between the attacks, the blood either undergoing partial absorption or is diffused through the retroperstoneal tissues and the viscera, or may gain access to the abdonunal cavity Suffusion of the mesentery and the intestinal wall produces an appearance which resembles incarceration or strangulation of the in-As the extravasation of blood continues, the more superficial parts become invaded, and discoloration of the skin in the lumbar, scrotal, and that regions occurs, a symptom of much diagnostic worth

The body temperature immediately after a retroperitoneal harmorrhage becomes subnormal as a result of loss of blood and shock. The secondary elevation of the temperature is quite characteristic, according to Doll, and is due to the absorption of fibrin ferment. Late infections may arise from bacteria which passing through the distended intestinal walls, cause abscess for

mation or even peritonitis The intestinal distention which is generally present is due to the rapidly developing hamatoma pressing on the intestines so suddenly that they do not have time to accommodate themselves to the change, fermentation of the contents is thus caused, and meteorism results. In addition to the pressure of the clot. Lenk describes a rellex irritation of the splanchnic nerves, and in this manner he explains the meteorism which follous operations for hamorrhoids, umbilical hernia, etc Distention occurs in the hamorrhages which infiltrate the retroperatoneal tissues and finally the mesentery itself. Then the function and possibly to some extent the nutrition of the bonel may be affected according to de Quervain, who has observed such distention in extraperitoneal runture of the kidney The suffusion of the mesentery and even the intestinal nalls permits some of the blood to mass into the lumen of the intestine and appear in the stools. This symptom has been noted by Lanen, who ascribes considerable value to it as a diagnostic aid

Jaundice has occurred in a few cases, is hamatogenous in origin, and has led to some difficulty in the diagnosis, as it has suggested gall-bladder disease

The examination of the urine was normal in only four instances, in even there was hematins, and in the remaining, some form of chrome nephrits was usually present. In four of the cases hematuria was due to umor formation, toberculosis, or hemophilia (Tuffier, Cathelin, Coenen). In Lawen's first case a town nephritis was present to account for the mild hematine.

The sume removed by cathetrization of the uretex in three instances has shown functional insufficiency of the affected kidney. In Lenk's second case indigocarimies was secreted in ten minutes from the left kidney, and a slight amount in one hour from the right. There was no to sponge to the philopidan test from the sub-Diminution in functional each price that the sub-Diminution in functional each price that the sub-Diminution is functional each price and Speece, in both, the kidney was found to be surrounded by a beamstorm, the organization of which caused compression of the kidney and contributed to its functional incapacity. The subsequent micro-

scopic examination (Lenk, Speese) of two of the organs demonstrated a chronic nephritis of insufficient degree in itself to cause the functional

changes noted.

A review of the reported cases shows that 16 occurred in males and 5 in females. The relative infrequency in the female set may be due to mode of life, the greater movability of the kidney, and the natural protection which the shaper, and the natural protection which the shaper, and the natural protection which the shaper, and the female predicts affords. The majority of the cases are seen in adult life, in males, and at a much younger penod than in females, the average being 29 years for the former, and 30 for the latter. The youngest case occurred in a male 18 years of age, and the oldest in a man aged 60 There is no site of predilection, for in the published reports of 17 cases, 8 occurred on the left and 9 on the right side.

The course of the disease is usually rapid, mediate operation being demanded for the severe nature of the pain, or death results from anamus, infection of the clot, or pulmonary complications induced by pressure upon the disphragm. The chronic nephritis so frequently associated with the disease may cause uramus, from which several patients have died. The disease in are ustances pursues a more chronic course and produces symptoms and intermittent attacks of pain lasting several months or even years (Lenk, Koch, Coenen).

The treatment of perirenal hæmatoma by measures other than surgical has been uniformly unsuccessful. There have been ten cures and six deaths from operations, one case died before operation was begun, and all four died who were treated by non-operative methods.

The operations performed vary from simple exposure of the kidney and drainage after removal of the clost to nephrectomy. In those cases in which the capsule is intact, drainage and to be sufficient. When the capsule is ton and the control of the case is tone sufficient when the capsule is ton as the control of the capsule is ton a secretal sufficient such on an organ which is not secretaling, several surgeons have performed on phrectal the capsule of the control of the control of the capsule of t

The percentage of deaths (52) indicates that the prognosis is unfavorable, but we must take into consideration the fact that we are dealing with a disease to which little attention has been directed. As our knowledge of the nature of the affection increases, earlier operations will be

performed before serious damage to the kidney or infection of the perirenal space is likely to arise.

CONCLUSIONS

r. Perirenal hæmorrhage is caused by tuberculosis, abscess or tumors of the kidney, necrosis of the adrenal gland, traumatism, and occasionally arises in hæmophilia. The spontaneous form is probably due to chronic nephritis, the only pathologic known which has been demonstrated.

2 The characteristic symptoms of the disease are sudden pain, the signs of internal hæmorrhage, and the formation of a retroperitoneal tumor.

3 A moderate degree of hæmaturna is present in one third of the cases Functional tests show diminution in the secretory activity of the kidney.

4 The affection is most commonly mistaken for ntestinal obstruction or paranephritic abscess

5 The disease pursues a rapid course if unrelieved, death resulting from hæmorrhage, infection, or pulmonary complications

 Medical treatment has been uniformly unsuccessful

7 Ten of the 16 cases operated upon have recovered (62 per cent). The mortality of the 21 cases treated by both surgical and medical measures is 52.5 per cent

Case 1 (Ibid ?) Female, aged 10 Duration 3 weeks Symptoms and findings sudden pain left side abdomen, pallor, tumor, sac contained 15 coagulated blood Cases alceration of aneutysm of renal artery (?) Diagnosis themorrhage from new growth. Unice normal Pathological diagnosis normal Result sac drained, exted

Case 2 (Idid 11) Male, aged ao Duration 1 day. Symptoms and findings pain and tumor formation in theo ageal repon, pallot, large tumor connected with kidney Cause sarcoma Diagnosis appendicitis Unnehamaturia Fathological diagnosis ulcerating round rell surcoma Result nephrectomy, death following day from harmorthage

Case 3 (Ibid 1s) Symptoms and findings swelling in kidney report or regarded as abscess, harmatoma from cancer of kidney Cause carrinoma of kidney Dagnosss permephritic abscess Result (z) removal of clots, (2) secondary nephrectomy, cured Case 4 (Ibid 1s) Oli man Symptoms and findings

Case 4 (10st 13) Old man Symptoms and findings inflammatory tumor in lumbar region, perirenal hæmaturia Cause interstitial nephritis Diagnosis abscess. Urine hæruturia Pathological diagnosis interstitial nephritis Result drainare death.

Orne neroturas catological toagnosis intersorial arphirits Result drainage, death
Case 5 (Ibid 12) Female, aged 25 Duration 6 months Symptoms and fadings hematuras, operation revealed sac containing aco gm blood between kidney and fibrous capoule Cause Tuberculosis Unine hematuras Pathological disgnosis tuberculosis kidney Result repherctomy, cured

Case 6 (Ibid 2) Male, aged 60 Duration 5 days, Symptoms and findings severe attacks of pain in left kidney region, tumor formation, meteorismus, suffusion in skin of hip and scrotum Cause afternosclerosts. Utine

dent

hematoma Result no operation, death Case 7 (fbid 2) Male, aged 41 Duration 6 days

Symptoms and findings. Intermittent attacks of pain in left sale tumor in two days, meteurismus, personal harmatoms Cause artenosclerosis. Diagnosis petirenal hemuoma Unne alliuminuria Pathological diagnosis tear in kidney cortex t i'm long, necross on micro-

CASE 8 (Ibid 16) Male, aged 50 Duration 12 days Symptoms and findings intermottent artacks of pain in right side of abdomen, thetention, collapse, dollares over kidney area fever, infiltration of blood in fatty capsule Cause nephritis Disgnosis paranephritic and appea diceal absiess, hydronephrous Leine albumin and casts l'athological il rignosis abscessof kirlnes Result

nephrections, sepsis, death
(1887 o (Ibid 8) Male, aged 27 Duration 6 weeks. Symptoms and findings intermittent artacks of pain in right sule of alslimen, which was right and tender, suffusion of fatty capsule a pints of blood removed. Cause. tuberrul >1 (2) Diagnosis thologostinis Unite albu-minuti x fathilligical diagnosis normal kelney Result ilrainage, cured

Cast 101/bif 51 1 emile, aged to Duration 6 days. Symptoms and findings examp-like pains in right sole of alst imen marked pullor, temperature 39", hematoma alze of child a freat, containing ferrit black dots. Cause parenchymatique neplintis. Diagnosis appendiced abscess Unne normal l'athological diagnosis nephritis. Re-

sult drainage, ifeath on fourth if iy

task it iffel 5) female aged 28 Duration 352 years Samptums and tindings attacks of pain during several years, turn or in tight i instal region, lever, yomiting, jaunifice, organization of hamatoma Cause hydrone phrous interstitual nephritis. Diagnosis hadronephro-Cent polyana Pathulogual diagnosis, chronic nephritis Result nephrectomy, pured

t sag 12 (Ibid 17) Male aged 41 Duration ii munths Similitims and findings conducte and home turnt, tumor in left lumber region followed by one on right, the latter contained blood the older one scrous fluid with evidences of this Cause interestinal arphritis Unite albumin, hi sai Pathological diagnosis inter-

CASE 14 (1861 14) Jemale aged 55 Duration days Symptoms and findings sublen pain right side, shook fever jounding, titing in gall bladder region, pers renal harmanama catending to measuring Cause abounce peplititis Diagnosis chilecystitis Unite albumin and casts. Pathological diagnosis normal. Result incision,

draininge, cured

Casi 14 (Ibid 3) Male aged 33 Duration 4 months Symptonia and unlings sudden pain centraliz ing in left kidney region, tumor in left lumbas region large hemstoma thick walled sir Cause hemophiles, inter mittal nephritis Dirgnosis tumor kidnes Utine Pathological diagnosis floating kidney, mitesblocst atitual nephratis. Result nephrestomy, post-operative hemorrhage, ileath

CASE 12 (16th 10) Male, aged 49 Symptoms and findings severe pains in left kidney region, unconscious-ness, distention of alsomen, tumor in region of left kidney. bematuma between kidney and its capsule and in quadratus lumborum Cause pyclonephrits Unine alba-min, casts Pathological diagnosis rend calculus,

p) eloneplintis Result death at beginning of operation CASE 16 (Ibid 10) Male, aged 18 Duration 12 days Symptoms and findings intermittent attacks of pun, niusca, comiting, fever, blood in atools, distention, hemorrhage between left kidney and fibrous capsule Cause: tout nephritis. Diagnosis perinciphritic abscess Utine albumin, casts, blood l'athological diagnosis toaic nephrits Result' drainage of hamatoma, cured. Case 17 Male, aged 40 Symptoms and findings fall, atriking buttock; had spastic spinal paralysis, autopsy revealed large harmatoma separating fibrous capsule from feft kielney Cause traumatism, Result: 20 operation,

Case 18 (15td 17). Male, aged 20 Duration 1 day Symptoms and findings severe pain to left side of abdo-men, swelling on same side, pallor, shock, slight fever, retroperstoneal tumor containing fragments of the adrenal gland, kelney and capsule normal. Cause necrosis and hemorrhage of adernal Diagnosis ileus Unne nor maí Pathological diagnosis normal. Result prera

tion, death in as hours.

(ASE 19 (Ibid 18). Male, aged 28 Duration 1 day Symptoms and Indings sublen pain in right thest and af-domen and symptoms of pentonitis, tumor in right lambar segrin, penjenal hymorrhage, kilney intact. Cause chronic nephritis. Diagnosis pentonius, Urine chron te nephritis, hamaturia. Pathological diagnosis kidney

Case so (1841 19) Male, aged 45 Duration 10 days Symptoms and findings pain in right lumber irgion for one half year, suilden attack accompanied by chill and nauera, tumor, pertrenal effusion discol ered Cause abscess kidney Diagnosis paranephnic abscess Unite normal Pathological diagnosis section of kidney abowed ulcers of cortes and medulia Result dramage, cured

Case so Opened Male, aged of Duration to days Symptoms and findings sudien and acute pain in right bypochondrum full weed by appearance of tumor in same region, pallor, shoul followed by fever of rot", penrenal hamstoma separating fibrous capsule and infiltrating fatty capsuse of hidney Cause thronic nephritis. Diagno-us perinephritic abstess. Unite alliumin, casts, sew red bled cells. Pathological diagnosis chronic nephritis. Result neghrectomy, cured

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A CASE OF BLOOD TRANSFUSION IN ECTOPIC PREGNANCY

BY EDWARD L CORNELL, S B, M D, CHICAGO

DIRECT blood transfusion in ectopic pregnancy is a procedure that has been used the past few years, I have been able to locate only three taxes. In a private communication, Dr. A. L. Soresi reports ten additional cases which he has collected from the literature or directly from the hospital records. In view of the wonderful changes for the better that immediately follow blood transfusion, it seems rational that this method should have more prominence in the treatment of ectopic pregnancy. Undoubtedly many lives could be saved which are now lost by infusion pormal salt solution alone

Case 41,5374 (Cook County Hospital). A M, mon (32) acts of the bouseful, both on Hungary Enterd the bospital December 20, 2011, with following batter 11, 1911. See missed the next one, which should have speeced December 10, 1911. Only two weeks previous speeced December 10, 1911. Only two weeks previous speeced December 10, 1911. Only two weeks previous wall. At that turns, after a brevy washing, also found, though was not profuse, until the entered the hospital Prod days prior to externing the bospital she littled something beavy and mmechasicy felt a sudden, sharp poin my continued to the control of the control

Upon entrance into the hospital she complained of being thirsty. She had been drinking water freely, but could not be satisfied. The feet and hands were cold. There was pain low down on the left side of the abdomen. It

was pain low down on the left side of the abdomen It was constant, with occasional sharp, shooting pains. Her menses had been regular, 28-day type, lasting four to five days, they began at 17 years of age. She had had two children, born normally, both fiving and well, had had

no macentages

Examination The patient was very pale and evident
by saffening from a great deal of abdominal pawn, rather
telluses. If the jaw and conjective were pale. Ches normal, later, action rayed, no marmurs. Addomin marked,
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¹ Since this report was written another case of eccepts programsy was transfered at the Presbyterun Hoop (a) by Dr Curis and one letter of blood injected. The patient was roorbund at the time of the translasion and revived remarkably. She died three days later from Complications.

¹I wish to thank Dr. Gilbert Fitz-Patrick, upon whose geryge the case sppeared for the privilege of reporting it also Dr. Arthur H. Curtis for his courtesy in performing the blood fransfusion.

considerable rigidity on the left side. No definite tumor mass was plopted. On vapoul examination, there was little bleeding from the uterus. The cervit was slightly softened and lacerated and admitted the up of the finger. The uterus was somewhat enlarged and not as firm as normally. It was slightly tender to the touch. A mass was palpated to the left of the uterus, which was very render. It was of a boggy consistency. The culder-size of Douglass was filled with fluid. The pulse was weak and thready, rate; 123, temp 92.7°, reps 40.

Options December 36, 1918. Temp 59 6, pulse 142, 1929 8 Ebre nanethers for 3 munues Incision in the median line. Ruptured ectopic pregnancy found, the kit table from near the outer end and a free blieding point seen in the tear. Tube clamped off and stipmesteomy done. Free blood and class found in the abdomen, estimated at 1200 cc, the greater portion of which was easily removed without injury to the peritoneum. About 1500 cc of normal salt solution was left in the abdomen. The abdomenal wound was closed at thout classing. Pulse

140, resp 48

After treatment
The patient was placed in bed with
the foot elevated about 6 inches
External heat was
applied Shortly after returning from the operating room
she began to incough Normal salt solution, 6 os, per
exturn was given every four hours. The public remained
may be the solution of the public remained
to the properties of the temperature chart the public
temperature and restartations will be seen more fully?

compensation of a strong and a strong a strong and a strong a strong and a strong a strong and a strong a s

dissected for about 2 inches under cocain anesthesia. The vein in the donor was tied and cut distally. One cannula was inserted in the distal end of the yein vem was held closed by pressure of the finger The recipient's vein was tied and cut proximal to the ligature. The other cannula was inserted into the proximal end of the vein A two-way pump was then attached to the neck of the bottle by means of a long, hard rubber tube. The vacuum side of the pump was applied and about 100 cc of blood run into the bottle. Enough sterile olive oil was then poured in to cover the top of the blood completely The pump was reapplied and the bottle filled. After filling the bottle, the pump was changed to a force pump and finger pressure reapplied to the donor's sen and the blood forced into the recipient's vein. The process was repeated, and about 250 cc more blood transfused. The veins were then tied off and the skin wounds closed

While transfusing the 500 cc of blood, there was a noticeable change in the pulse. It became stronger, there was also a return of color to the patient? is just 181f and hour after transfusion, her pulse was reduced to 128, fulf and hounding in character. The respirations dropped to 40. The patient's general condition improved markedly.

40 The patient's general condition improved markedly. From then on the patient improved rapidly, except for temperature, which was present for the first nine days, due (as we found out later) to wound infection. After releas-

No. of Patient 471827 Ward 5 Name A. If

Disgrassis Ectopic Preg. Ac. Hemorrhage. Date December, 1911.

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ing the confined pus the temperature dropped immediately and remained practically normal throughout her stay in the hospital. She was discharged Jebruary 3, 1917, cured. I saw the patient several turnes during the next three months, and she was enjoying fine health.

It is my opinion that blood transfusion was the life-saving measure used in this case. While it was done after operation here, I believe that, in suitable cases, blood transfusion will present death in many cases if it is resorted to before or during operation. Those cases which are in shock and which have a running pulse could be revixed by blood transfusion so that they would be better risk for operation. WERDER: THE CAUTERY IN TREATMENT OF CANCER OF THE CERVIX 579

THE CAUTERY IN THE RADICAL TREATMENT OF CANCER OF THE CERVIX

A CORRECTION

BY X O WERDER, M D, PITTSBURGH

T N the original article in the March issue of SURGERY, GYNECOLOGY AND OBSTET-RICS (pp. 272-280), it will be noted that there is a discrepancy between the statistical table and the accompanying text While the text is correct, the statistical table shows somewhat different results, this being due to the fact that, through a mistake on the part of the publishers, an old table was printed which was submitted a year ago for publication, instead of the one presented with the paper as read before the Clinical Congress of Surgeons One year elapsed between the writing of the first and second papers, and this, of course, required some revision of the table, as new cases came into the five-year period. In the meantime some cases died, and those living should have been credited with one year more than appears in the table. Instead of changing the table of results accordingly, the new cases were simply added without revising the record of the old cases.

Briefly, the changes should be as follows clease being referred to by number corresponding to those in the table printed): Cases 26 to 39 inclusive are correct as printed in cases recorded as living, from 1 to 25 inclusive, one year should have have been added to the length of time since the operation of these patients with the three following exceptions:

CASE 18. Mrs M S, recorded as living 6 years, vesico-vagnal fistula still present, should be revised Death after six and one half years (March, 1912) from carcinoma of the liver

Case 22. Mrs D P B, recorded as living five years, health poor but no evidence of recurrence; should be revised Death after six years from carcinoma of retropertoneal glands and spinal cord.

CASE 25 Mrs J L, recorded as living five years, had vesico-vaginal fistula, recurrence, should be revised Death after five and one half years from recurrence

SCHMARY OF RESULTS

Deaths alter five years from recurrence—4
cases
1 after 61/2 years from carcinoma of

- liver
 i after 6 years, recurrence in retro-
- peratoneal glands and spinal cord after 5 years, recurrence in lumbar glands
- l after 5 years, site of recurrence not known Death from intercurrent disease after 6 years

Living and well at present time-13 cases. 331/3%

For the article in full, see pp. 272-280 of the March, 1913, issue of Surgery, Gynecology and Obstetrics.

TRANSACTIONS OF SOCIETIES

CHICAGO SURGICAL SOCIETY

REGULAR MFETING HELD JANUARY 10, 1913, WITH THE PRESIDENT, DR. CHARLES DAVISON, IN THE CHAIR

DR WILLIAM HESSERT read a paper on "Some Observations on the Anatomy of the Inguinal Region with Special Reference to Absence of the Conjoined Tendon" (See p. 566)

DISCUSSION

DR ARTICE DEAN BEVAN. I have been very much interested in Dr Hessert's paper. I have never seen in the cadaver a dissection in which there was not a bony insertion of the lower part of the fibers of the transversals and internal oblique into the jubbs. I have seen just what Dr. Hessert has pictured here in the diagram of the internal oblique and transversals arehing up over, and no definite aponeurosis with the conjoined tendon apparant. But when the dissection is completed there is always a tendinous insertion into the body of the public bone.

DR I. WYLLIS ANDRERS: The essavist states that he always operates upon the weak ring on one side secondary to the appearance of a herma upon the other. In this statement he voices a sentiment I have expressed repeatedly, and as time goes on I more firmly believe it. The average adult who acquires a hernia upon one side will be found to have a weak ring on the other side. The occurrence of another herma is most likely, we have therefore been gradually led into the practice of doing what I call in my clinic a "phantom" or "humbug" hermotomy on the other side. We are duplicating and fortifying the weak walls on the other side, because time and again natients come back to us with the other side ruptured, and we find in our records that a natulous ring was recorded at the first operation. These patients come back to us with a hernia, and we say, as long as the operation is not attended with any risk or serious drawbacks, why not do the operation, even though occasionally one may be done unnecessarily. Referring to the drawing of the anatomy in the paper, I will point out in a little different way my mental picture of the "red muscle" (internal oblique). Just as Dr. Mayo pointed out in a recent interesting paper, there

is a pathology in the living different from dead pathology, so we must bear in mind that anatoms in the living is different from the anatomy in the cadaser Opening the inguinal canal in any kind of hernia, oblique or direct. I have noticed, in more than 1,000 cases I have done, the conjoined tendon and "red muscle" clear down half the length of Poupart's ligament and underlying the whole length of the cord in normal canals Beginning at the outer end and running right along forming the posterior wall is a heavy red muscular floor, and this muscle oftentimes is partly between the cord and Poupart's ligament, so that the canal is not bounded above more by ligament or behind by muscle and in front by aponeurosis, but the canal as tunneled through muscle. There is muscle below it and muscle in front of it and behind and above it That sort of patient does not have any border or lower edge to his red muscle. We do not know which muscle that is I have never yet been able to tell whether it is the transversalis or internal oblique Are they not united like one muscle at their lower segments?

Dr. Hesser: They are one. You cannot

And the second of the second o

A short time ago at the County Hospital I had absolutely that picture from here to here (ladicating), with imiscular edge. The fibers, it is true, as Dr. Bevan says, may become tendinous and run down to the pubes. Everybody in America recognizes that a Bassini operation is mackingly useless in very large rungs, and there

are all sorts of plans, of which Dr. Hessert only mentioned one or two, to supplement by some adequate plastic method and each heteroplastic method this deficiency. Mere Poupart's Egament is pulled up and the opposing tissues down, the muscle is under great tension. The Bassini operation becomes impractical in such cases. If one cuts the sheath of the rectus vertically he is quite able to bring a few strings of that muscle out, a picture of which is given in Kelly's "Gynecology." The method is similar to the Halsted. But some operators take the edge of the tectus intact without cutting, that is, the sheath, muscle and all, which I have never found to work. Can you do that?

Dr. Hessert: I have never found it to work.

There is too much tension

Dr. Andrews: Here is a thing I do perhaps one time in twenty: When I get these extraordinarily large rings, or some case that has been operated upon and there has been a recurrence and the landmarks are destroyed from muscular atrophy, and there is nerve or muscle destruction, I use one step of the old obsolete Wolfler operation. Taking Poupart's ligament as the radiusof a circle, strike a quadrant here, make a section right half way across the rectus muscle through the sheath of it, and meet that with a vertical section up through along the linea alba, thus a triangle is formed of the rectus sheath The shape and form of the triangle is precisely that of this canal if you evert it. You can evert it and imbricate it in four different ways. You can turn that triangular flap of the anterior rectus sheath and put it in behind the cord, or you can put it in with that muscle in the same stitch over in front of the cord, or you can do the ordinary imbrication operation, leaving the rectus sheath still loose, imbricating the lower segments over the upper and taking this over all, tacking it right down through I have done it by all methods. Dr. McArthur criticised this technique on theoretical grounds. He thought the rectus muscle being deprived of its sheath would form a ventral hernia or be a weak spot I am disposed to think that a new sheath would develop from cicatricial tissue

DR. ANTIUM DEAN BEVAN. I think Dr. Hessert has presented the general principles very clearly and concisely, and I always like to hear Dr. Andrews discuss this subject, because I think he knows more about it than any other man in this country. I am particularly in sympathy with the points he makes in regard to utilizing the anterior sheath of the rectus in those cases where there is a deficiency. The muscle fibers are

not worth anything. Where there is this deficiency, to attempt to cut and pull a flap of muscle fiber out of a very stiff, tense rectus is, on the face of it, not worth anything. It is not like muscle which is easily pulled out and not on tension. I have used muscle a number of times, but never with great satisfaction. It was of no value, especially because at the lower point there is a good deal of fibrous material in the rectus, and it is very tense and strong, and when there is vomiting or coughing on the part of the patient, any rigidity, of course, would pull out the soft muscle stitches from that point to this (indicating) But I do think the suggestion of Wolfler (and I have used that with more satisfaction than anything else in these cases) is very well worth while and the best resource we have in cases where there is deficiency. I am wondering if the new chapter that is being written in modern surgery on free transplants of fascia will not furnish us an opportunity or material for helping in some of these cases of too large a ring. Why could we not take a good size piece of the fascia lata and utilize it as a free transplant, as is being done so frequently in other positions? I understand the theory is that these free transplants will retain their functions of tense fibrous tissue that will give resistance provided they are put to use. and certainly it would be put to use with the intraabdominal tension that would be placed upon it in one of these hernia operations.

I am rather inclined to think we are a little behind our European colleagues in hernia work. not from the standpoint of the technique of the operation, but from the standpoint of the anæsthetic. I rather think in the next year or two almost all of us will be doing hernia operations exclusively by the Heinrich-Brown technique of scopolamin-morphin preceding operation, and the use of a couple of ounces o 5 per cent of novo-cain with a little adrenalin added Following the Heinrich-Brown technique and waiting for ten minutes after the injection, almost any hernia can be done with more comfort to the patient. I am rather inclined to think within the next few years we will see the passing of general anæsthesia in hernia work. This is particularly important in operations for strangulation. I would say without any hesitation that in strangulated hernia, with the patient a bad surgical risk from shock or from the condition of strangulation, any other technique except local anæsthesia would bave to bring very definite and particular reasons for being employed.

DR A. J. OCHSNER: The anatomical condition indicated here in these illustrations certainly

exists, but I think if one should dissect those patients later on he would find the conjoined tendon extending down in front of the rectus abdominus muscle to its inserts or in the os pubis. For practical purposes we have to deal with this con-The operation that I have done quite frequently in such cases is to shove back the aponeurosis of the external oblique to the inner margin of the rectus, and then make a fascia flap Instead of taking the rectus muscle as it is, I make a small flap of its external and anterior tascia, which I suture to the posterior surface of Poupart's ligament, and then take the muscle which is loosened and with two sutures bring that over to the ledge of Poupart's beament. using the Ferguson method by leaving the cord behind I cut the sheath in front, so that the external layer goes backward instead of making a deep flatt like Wolfler. I apply the muscle su tures loosely without constructing the muscle, then I bring the internal oblique and transversalis to the ledge of Poupart's bgament and later carry the fascia of the external oblique over as far as I can by Dr Andrews' method, and then take the internal fascia and earry that away out over all the lavers again. After doing that, I do not recall any ease of recurrence of herma, although I must confess I have not followed all of the cases very closely

TOR DANIE N EISENDRATH There is one important point which has been brought out in this discussion by Dr Andrews, and that is the utter futility of traing to do a hermotomy by the old Bassini method when the internal oblique makes a very wide arch and there is practically no consolred tendon. When the internal oblique or red musele is very atrophic and is very much infiltrated with fat, the Bassim operation as ordinarily performed is often a failure Under these two conditions the ordinary Bassini operation is of no avail because we know sooner or later the atrophic muscle pulls away from Poupart's ligament. De Andrews is entirely too modest in proclaiming the merits of his modification of the Bassini operation I have done about 200 operations of this kind by his method and have never had any cause to regret it The technique which I follow to exactly as Dr Andrews has laid it down, the only difference being that where he takes the internal oblique and internal portion of the external oblique in one suture, I think we get a nicer line of apposition in these cases if we make a continuous suture. I transplant the cord, and am careful to make the first suture include as much as I can of Gumbernat's ligament and conjoined tendon, and then put in a continuous suture of kangaroo tendon up to the internal ray, bringing the red (internal oblique) muscle to the inner side of Poupart's ligament Up to this time the suturing is interrupted temporarily while putting in another suture above after Colev. to avoid recurrence. Then after that suture I continue with the lower kangaroo suture, now pulling the internal layer of the external oblique down to Poupart's ligament. In this way we get two layers (internal oblique and the inner leaf of the external oblique) accurately in approximation with Poupart's ligament. I have given up the old Ferguson method (non-transplantation of cord) for the reason that cases have passed through my hands where other operators have had recurrences take place at the lower end of the suture line, i e just above the pubic bone, because you cannot get in the Ferguson operation a sufficiently clastic opening for the cord to pass through above the public bone without danger of recurrence. You cannot get as close and as accurate approximation of the muscles as you can il you use the Coley modification. For that reason

I transplant in every case Another point is this: In a great many of these cases I have learned a lesson from watching Dr. Andrews' work at the Michael Reese Hospital If you watch some of the cases with this weak internal oblique or lack of development of the compined tendon, where you have operated on one side, in five or six years (and in one case I recall eight years clapsed) a patient will come back with a herma on the opposite side and you have to operate on that side Dr Andrews has taught us, if possible, if we have these patients that have a well developed hernia on one side and have a neal, internal consolned tendon on the other side, it is better to do a pseudohermotomy to prevent the formation of a hernin. It is a satisfactory was to do. You can usually make a diagnosis of the presence of oblique deficiency before operation If you will take these patients and use your finger, you will find you can run the fingers well under the arching fibers, so that two or three of the fingers will go to the inner end of Poupart's ligament to the arching fibers, which is the way to make a diagnosis of a weak internal oblique before you make any incision These points are of great importance because they show why we get mans recurrences after hernia operations

Dr William Fuller I would like to ask Dr Andrews a question He spoke of Dr. McArthur having criticised the method he has described for leaving a space in the rectus abdomins muscle What have been your results, doctor? Dr. Arderwis: The results have been satisfactory. I find this flap method an ideal one, possibly the only one on which reliance can be placed in enormous rings. One word about the rectus muscle. Dr. Hessert brings out the muscle after splitting the sheath. I cannot understand how he can get any support from the muscle I have found it split off as rapidly as the stitches were tied. I would like to have him tell us how he gets good repair out of the muscle after he gets

the sheath off of the muscle fiber DR. WILLIAM HESSERT: In regard to the suggestion about the muscle being tense and not coming down, that is true. For that reason, I have found this method rather unsatisfactory, because in muscular individuals the rectus is tense and you cannot get more than possibly three stitches inserted, and there is great tension and it does not look good. This method Dr Andrews mentions is a splendid one I have never tried it, but will bear it in mind and will try it as the occasion presents It gives you all the support of Dr. Andrews' method plus the extra broad sheath of fascia I think it is really far superior to the method of splitting the edge of the rectus and bringing the muscle down or a small portion of the fascia down, as Dr Ochsner suggested, and of course in that connection we all remember that the same results can be accomplished in so many different ways One man will do an operation one way, and another another way, and there will be no recurrence of the hernia, and they all get good results.

I should like to have heard the gentlemen discuss more the anatomy, because that is what I was mainly interested in. I should like to obtain information from Dr. Bevan as to what he finds and calls the insertion of the fascin of the internal oblique and transversals behind the rectus. In a large work on anothery I was looking over—Bardeleber's. "Handbuch der Anatomie des Menschen"—I remember finding nothing mentioned of fibers that go back of the rectus. I should like to learn more about that from Dr. Bevan

Dr. Andrews another question If I understood bim correctly, he turns the sheath over the hernia opening Why not slide it? What is the object of turning over the sheath of the rectus?

Dr. Andrews You want to keep the attachment to the outer border, as a hinge joint it swings right over into an inverted position, otherwise you would have a narrow pedical at the bottom which would not be well nourished. It turns over the the hinge of a door, and fills the gap without tension. It is in fact almost too wide Perhaps a little less than half the width of the anterior rectus sheath would answer as well.

DR ARTHUR DEAN BEVAN: As to the anatomy referred to by Dr Hessert, the external oblique, the internal oblique, and transversalis pass in front of the rectus

pass in front of the rectus

DR HESSERT: Can you demonstrate that in
the living?

Dr Bevan Yes, of course you can

DR HESSERT It is merely a clinical presenta-

DR BEVAY: When you make your dissection, these muscle fibers become tendinous and pass into the bone from the spine of the pubes to the symphysis

CORRESPONDENCE

DIABETES MELLITUS

I am undertaking an exhaustive research into the pathology, etiology, and dietotherapy of diabetes mellitus. I am very anxious to bear from every physician in the United States who has a case under treatment or who has had any experience in the treatment of this malady. Von Noorden says, "The best treatment for the diabetic is the food containing the greatest amount of starch which the patient can bear without harm." If any physician who reads this has similar or contrary experience I would exteen it a special privilege to hear from him.

WILLIAM E. FITCH, M. D , 355 W 145th St. New York City

RESULTS OF THE RADICAL ABDOMINAL OPERATION FOR CANCER OF THE

UTERINE CERVIX

A CORRECTION

In the article upon this subject by Dr. John A. Sampson, which appeared in the March number of Surgery, Gynecology And Obsertages, in the body of the text the references to the pictures illustrating the article were inaccurately Jaaced in our editorial offices. In the text for Figs 2 and 3, read Figs 3 and 4, and for Fig 4 read Fig. 2.

BOOK REVIEWS

FRACTURES AND DISLOCATIONS By Lewis A Stimpon, B A . M D . LL D Philadelphia and New York Lea & Febiger

By the publication of a seventh edition of his already well known and much appreciated book entitled "Fractures and Dislocations," Dr Stimson has brought his work strictly up to date on the two big and important subjects with which be deals

The open treatment of recent fractures, with its indications and technique, a subject which of late has been causing much discussion, together with the treatment of old dislocations are the most important additions to be found in this new edition.

There are three new sections devoted to fractures of the small bones of the hand and foot, and there are more than one hundred new illustrations from photographs and skiagrams which greatly aid the practical application of the advised principles of

treatment

As in the preceding editions, the author divides his book into two parts Part I dealing with fractures and Part II with dislocations In each instance the subject is first dealt with as a whole in chapters devoted respectively to Pathology, Etiology, Symptomatology and Diagnosis, Mechanism of Repair, Complications, and Treatment This is followed by a regional division of each subject,

so simply classified according to anatomical ar rangement that it affords an invaluable reference book in practical work

Every fracture and dislocation is carefully considered, and particular emphasis is laid upon the different methods of reduction and fivation of each variety, together with the most detailed description of the various forms of apparatus used

EUGENE S TALBOT, JE.

DIFFERENTIAL DIAGNOSIS OF DISEASES OF THE NEEVOUS SYSTEM By Henry Hun, M D Troy, N Y The Southworth Company

In this book the author makes use of charts of all kinds, in which one is able to trace the different symptoms which he has detected to the causal disease It is also attanged so that such symptoms as he has overlooked will be suggested to the student as he passes over the explanations and illustrations Everyone who has studied and crammed for an

examination or test of any kind knows that he can learn things from his own notes that are impossible from those of another man, while those of a third will be perfectly clear To me it seems that this

book will fill a long-felt want to many men interested in neurology, while to others it will be impossible. The notes are clear and the deductions from a certain group of symptoms are easily made. The illustrations are well made, WM. R CUBBINS.

Souccery Its Principles and Practice Vol VI Edited by William W Keen, M D LL D Philadelphia and London W B Saunders Co , 1913

In editing a sixth book, Dr. Keen has exceeded his original intention of publishing a complete

system on surgery in five volumes

The rapid strides in the development of surgery not only have resulted in the establishment of new principles of therapy, of new operative and labora-tory technique, and of new theories, but have also rendered obsolete some of the procedures which were generally authorized during and just preceding the time of appearance of the original five volumes, between the years 1906 and 1900

This supplemental volume is evidence of Dr Keen's realization of the expansion of surgery and of his appreciation of the fact that because of this increase of surgical knowledge, no work can continue to be the standard authority even for a few years unless it is kept up to date by additions

Although the last five years have shown great surgical advancement in every department, it has been most marked in the physiology and surgery of the hypophysis, in thoracic surgery as performed with the newer positive and negative pressure apparatus, in the administration of ancesthesia by intratracheal insufflation and the intravenous ether methods, and in the chemical and electrical treatment of cancer Not only are all of these newer subjects discussed exhaustively by surgeons whose names are intimately associated with their development, but every other surgical subject which may be found in the preceding volumes has been brought strictly up to date, in so far as the advancement has passed beyond the experimental stage

The same policy, if possible a little more ex-tensively carried out, of amplifying and clarifying the writers' words by the liberal use of colored plates, photographs and hae drawings, of operative steps, of apparatus and of pathological specimens, renders the subject-matter assimilable and easy of application, as in the previous volumes.

In conclusion it may be said that this new edition makes the system as nearly an authority on the enture field which it covers as any work which is on the market to day EUGENE S. TALBOT, JR.

OPERATIVE OBSTETRICS, INCLUDING SURGERY OF THE NEW-BORN. By Edward P Davis, A M, M D. Philadelphia and London: W B Saunders Co., 1912

The appearance of a volume devoted to operative obstetrics from so distinguished an author marks distinct advance in American medical herature Added to the results of his chinical experience is evidence of wide reading, the various sub-headings being accompanied by bibliographics which give the text a definite value as a work of reference.

In his introduction Dr. Davis discusses very binef, by the anationy of the reproductive organs and their relations during pregnancy and labor. Emphasis is placed upon assepans of the bruth canal and the prophylains and control of harmorrhage. The importance is shown or jezarding the pregnant woman as a surgical patient and the point that women as a surgical patient and the point that women as a surgical patient and the point that women as a surgical patient and the point for surgical interference is well made. In obstetines massibilities a under preference for the post of the properties of the prope

The greater portion of the volume is taken up by Parts I and II. designated respectively as the Surgery of Pregnancy and the Surgery of Labor general proposition surgical procedure during gestation is advised against except in extreme cases, such as carcinoma and ovarian tumor. In this part are considered the treatment of uterine displacements, repair of cervical lacerations, removal of uterine tumors, and operations on the appendages. on the rectum and on the perineum Therapeutie abortion and the induction of labor are carefully discussed Abortion is indicated in toxximia, tuberculosis, transmittable nervous or mental conditions. but not in contracted pelvis, fibromata, ovarian tumors, carcinoma, or the acute infectious diseases In the induction of labor the bougie is preferred, with the rubber bag a second choice. The diseased appendix, gall-bladder, and kidney are treated, in general, the same as in the non-pregnant state When abdominal section is thus performed, the author deems it justifiable, if the foctus is viable and the maternal condition critical, to include delivery by uterine section. In ectopic pregnancy he operates on diagnosis except where, the patient heing in shock, immediate operation would seem to turn the tide against her

The extraction of the child by the vagnal route is first taken up in Part II I he lateral position is favored in spontaneous delivery. Extraction in treech presentation is very well described, indeed, and where manual extraction of the head fails, the use of the forceps on the after-comming head is indicated. Delivery by forceps is very thoroughly some into The use of the sub-raction instrument is strongly advocated. The Illustrations of this hapter are profuse and illuminating and since the

volume is evadently intended for students as well as for the practitioner, it is regretable that the indications are not more definitely set forth. Likewase there is no concise differentiation made between extraction in low and in high arrest, the author considering such distinction of theoretical rather than of practical unport. Concerning conditions making forces delivery justifiable the author says:

"It has been abundantly shown that the use of orceps upon the head not engaged above the pelvis or but ust beguning to enter the pelvic brim is followed by dangerous pressure, often hy cranial or intracranial harmorrhage, and permanent injury to the nervous system. In many cases the child dies as the consequence. With other obstetric operations as successful as are now pulnotomy and Cesarcan section, unless the child is to be deliberately sarrificed, the forceps should not be applied to the head until engagement and molding have occurred. It is proposed to scarcifice the child, cranistomy is safer for the mother than difficult forceps extraction, the lead on to bring ranged."

This too may well be taken to heart by many physicans: "A competent annesthetizer and assistant should be at hand, and the necessary apphances for checking hemorrhage, preventing infection, and repairing lacerations If these conditions and surroundings cannot be commanded, a physician will do well to abstain from the application of forceps and summon competent aid."

"Failure of the head to engage and partially descend, brow presentation partial blom presentation, posterior rotation of the chin, a fertus complexed by a tumor or pathological conditions making its delivery impossible, contraction at the pelvic outlet, stenosis of the vagina and pelvie floor partial distantion of the carrier with imfiltration of the carrier with infiltration of the carrier with infiltration of a dead child in a contracted pelvis, form the principal contraindications for the use of the forceps."

Dr Davis' almost epigrammatic frankness is refreshing Seldom in a text do we find a frequent fault as succencily condemned as in the following:

"It may seem incredible that an educated physician would attempt to drag the foetal head with the obstetric forceps through a pelvis too small for Yet those who see cases brought into hospitals and who have a consultation practice will admit with regret that such is the case. The simple rule of practice which asserts that after a reasonable time, the head not descending, it must be pulled down, and that if one physician cannot pull it down two or more can, is sure at some time to bring its follower into an obstetric disaster. It may be too much to expect the general practitioner to know and practice pelvimetry or for the recent graduate to provide himself with a pelvimeter. But recent graduates are taught to recognize engagement of the foetal head, and general practitioners should have learned the same lesson" Many of the younger corps of teachers who have hesitated to speak out so plainly can only leel grateful towards one of Dr. Davis' position for having written so bluntly and so truthfully.

Version, embryulcia and pubiotomy are equally well treated of and abundantly illustrated. Vaginal and abdominal Casarean section are concisely described, the indications for each being in accordance with the best American teaching. The results of the author's ninety-five cases of celiohysterotomy are excellent Of 72 uninfected cases, but one mother died, and of the 20 infected cases, & died, the twelve surviving having been treated by the Porro method Of the first group all the children survived, of the second group six were dead at the time of operation and four died from inspiration pneumonia and birth pressure Rupture of the uterus and inversion of the uterus comprise the subjects which complete this part of the work devoted to the surgery of labor

Manual delivery of the placenta, hæmorrhage during and following labor, placenta pravia and premature detachment of the placenta are the first subjects considered under Part III. Surgery of the Puerperal Period Classical Casarean section is advocated where the placenta covers the internal os, and runture of the membranes with the use of a rubber bag is preferred to version where placenta provia lateralis obtains The treatment of pla-

cental separation is summarized as follows "In patients in private houses and not under the care of an obstetric surgeon the use of the tampoon by the rotunda method, with or without rupture of the membranes, will control the hamorthage and give a reasonable chance for the mother The survival of the child will be the exception and not the rule. In cases where a diagnosis is made early, with mother and child in good condition, delivery by section, with hospital advantages, will give the mother the best chance for recovery, with a possible chance for the child" In all cases where the nationt is weakened by excessive loss of blood, section should not be undertaken and general anæsthesia should be avoided

The immediate repair of cervical, vaginal and perineal lacerations is strongly upheld by the author, the methods of the secondary operations being also described The correction of uterine displacements is given brief attention, and mention is merely made of post-partum relaxation of the abdominal wall It is regrettable that greater space is not given to this fatter most important border line condition, of which the author should have much to teach The surgery of puerperal septic infection and the treatment of mastitus conclude this portion of the text In treating pelvic thrombophlebitis Dr Davis takes no decided stand as regards ligation or excision of the infected veins, merely regarding the operation as a justifiable procedure in the early stages of pyzmia

The surgery of the new-horn is a short chapter comprising such subjects as asphyria, umbibical hæmorrhage, birth fractures and paralysis, injunes to the scalp, congenital lack of development, infections of the new-born, and circumcision

Throughout the text the reader welcomes the frequent interposition of ahundant references, these providing in many instances an almost complete bibliography of the subject under discussion. Everywhere illustrations are most abundant and helpful to the text. In general the procedures described are the ones justified by the author's own experience, other methods being disregarded or merefy mentioned, the only exception to this rule being the rather comprehensive consideration of the extraperitoneal Casarean section In imprint the volume comes up to the standard long established by the publishers

CARRY CULBERTSON.

BOOKS RECEIVED

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FOURTH ANNUAL SESSION CHICAGO NOVEMBER 10 10 15, 1913

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CHICAGO AS A MEDICAL AND SURGICAL CENTER

1. THE SURGEONS OF FORT DEARBORN

By M. M. QUAIFE, CHICAGO

/TABE medical annals of Chicago go back to the visit of the tirst white explorer, and their beginning involves us in Chicago's first mystery When Johet and Marquette were returning from their famous exploration of the upper Mississippi in 1673, the latter was persuaded by a band of Illinois River Indians to promise to return again and instruct them I'or Marquette the expedition ended at Green Bay. Here he spent the summer of 1674, worn down by the illness which was shortly to terminate his career. In the autumn, the disease having temporarily abated, he undertook the fulfillment of his promise to the Illinois Indians. With two voyageurs and accompanied by a party of Indians, the brave priest pushed his toilsome way down the western shore of Lake Michigan to the mouth of the Chicago River Over a month was consumed in this journey, owing to the delays caused by the stormy fake. The Chicago

River was frozen to the depth of half a foot, and snow was plentiful Marquette's malady having returned, a winter camp was made two leagues up the South Branch Here, in his wilderness but, the sick priest whiled away the time from December until April, the neighboring Indians vying with his two white companions in ministering to his comfort and supplying his wants In February Marquette began a novena, or nine days' devotion to the Virgin Mother, to ask God for the restoration of his health, and shortly afterward his condition improved, in consequence, as he believed, of his devotions. Marquette found that two Frenchmen had already established themselves in northern Illinois, some eightern leagues below Chicago, and engaged in an illicit trade with the Indians. One of them was Pierre Moreau, a noted courser du bois of the time, while his companion is designated by Marquette only as "le chirurgien"- the surgeon. The

little the priest tells us of the surgeon serves only to whet our curiosity. As soon as he learned of Marquette's illness he came, in spite of snow and bitter cold, a distance of fifty miles to bring the sick man some corn and blueberries Marquette sent Jacques, one of his two companions, back with the surgeon to carry a message to the Indians, and the traders loaded him on his return with corn and "other delicacies" for the sick priest. Furthermore the surgeon was a devout man, for he spent some time at Chicago with Marquette in order to perform his devotions Clearly we are dealing with a character who improves with closer acquaintance. But such acquaintance is denied us. As a ship passing in the night the surgeon flashes across Chicago's early horizon, whence he came, whither he went, even his name, will probably remain forever a mystery.

The permanent establishment of the profession of medicine at Chicago dates from the founding of old Fort Dearborn in the summer of 1803 The career of Dr Smith, the first surgeon of the Fort Dearborn garrison, and his successors, comprises an interesting, and for the most part as yet unwritten, chapter in the history of Chicago Our information concerning the career of Dr Smith is all too scanty Presumably he accompanied the troops of Captain Whistier's company on their overland march from Detroit to Chicago in the summer of 1803 Ateany rate he had been at the post some time when he wrote, on December 9, 1803, a letter to a friend in Detroit recount ing his experiences and describing the condition of affairs at the new post Although winter was at hand the post was "not much advanced," and Captain Whistler and the garrison were housed in small temporary huts The surgeon, however, was more fortunately situated. In partnership with John Lalime, "a very decent man and a good companion," he had rented for the winter a cabin belonging to John Kinzie, the St Joseph River Indian trader, and fixed it up in a comfortable manner The troops found Chicago "tolerably healthy at present," although upon their arrival they had suffered much from bilious fevers That the improvement was but temporary is shown by a letter of Captain Whistler to his superior officer the following summer, in which he reports that over half his men had been ill The prevailing diseases were ague and fever, long the curse of the western country

Dr. Smith remained at his lonely station for hie years. His successor at Fort Dearborn was Surgeon's Mate John Cooper of New York. Of Cooper, thanks to his friendship in after life with General James Grant Wilson, who is still living in New York City, we know more than we do of his predecessor. Cooper's grandfather, a British soldier, fought under Wolfe at Quebec and was near his leader when he fell, mortally wounded at the moment of victory The grandson was born at Fishkill, New York, in 1786. He was but 22 years of age, therefore, when he came as surgeon to Fort Dearborn He journeyed to Chicago by way of Albany and Buffalo, where he boarded the brig "Adams," Commodore Brevoort's "navy of the lakes " The journey across Lake Erie consumed a week, and another week, including stops, was spent in passing through the river and Lake St Clair and on to Mackinac After several days' delay at the latter place, the brig proceeded by way of Green Bay to Chicago, which was reached in three days After three years' service at Fort Dearborn, Cooper resigned from the army and returned to the Last by way of the Indian trail to Detroit, which had been followed by the troops on coming to Fort Dearborn eight years The journey to Detroit required fourteen days From Detroit the traveler went by way of Fort Wayne and Pittsburgh to Poughkeepsie, New York Here he made his home and practiced his profession for over half a century, dving in 1863

Fort Dearborn and Chicago's third resident surgeon was Isaac Van Voorhis Like Cooper he was a native of Fishkill, New York, and a member of the same class in college to which his predecessor belonged Van Voorbis was 21 years old when he came to Fort Dearborn, and only 22 when he was slain by the Indians in the summer of 1812, yet the few facts which have been preserved concerning him tend to the conclusion that he was a young man of unusual breadth of vision and loftmess of ideals. When asked if he was willing to go to the garrison at Fort Osage, then the remotest outpost of the government, on the Missouri, he answered "I am ready to serve my country wherever my services may be required." In October, 1811, a few months after his arrival at the equally lonely wilderness station at the mouth of the Chicago River, he wrote to a friend in his native village in the following prophetic stram: "In my solitary walks I contemplate what a great and powerful republic will yet arise in this new world. Here, I say, will be the seat of millions yet unborn, here the asylum of oppressed thousands yet to come. How composedly would I die could I be resuscitated at that bright era of American greatness - an era which I hope will announce the tidings of death to fell superstition and dread tyranny."

Less than a year later, in the Fort Dearborn massacre of August, 1812, the young surgeon gave up his life for his country, composedly, the writer has faith to believe, in view of his ancestry and training By a peculiar irony of fate, however, in most of the accounts that have been written of the Fort Dearborn massacre Van Voorhis has been singled out for obloquy by being portrayed as having died like a terror-stricken coward This representation originated in an account of the massacre based mainly on family recollections and written down after the lapse of a third of a century of time It is worthy of note in this connection that Captain Heald in his official report of the battle uttered no word of di-paragement of the surgeon's conduct, announcing, on the contrary, the news of his death with "great sorrow" Commenting upon the whole incident, an eminent Chicago practitioner of a later day, Dr James Nevins Hyde, thus concludes. "Too many surgeons have exhibited not only a consummate skill, but a splendid courage upon the field of battle, for their professional brethren to doubt the compatibility of these var-They will only remember, therefore, of their martyred representative in the battle of Chicago, that he was sorely wounded in the discharge of his professional duties, and that he died the death of a soldier "

That the survivors of the massacre must have sorely missed the ministrations of the slaughtered surgeon seems obvious A number of the soldiers were wounded, some of them in greevous manner Captain Heald had been shot twice, and never fully recovered from the wound caused by a bullet in the hip, which he carried to his grave

twenty years later Lieutenant Helm, the other surviving officer, had a flesh wound in the heel Mrs Heald had received a half-dozen wounds, none of which proved permanently serious. The same family tradition which sets forth the cowardice of Van Voorhis records a crude surgical operation performed upon Mrs. Heald. Upon the refusal of an Indian chief who was reputed to possess some surgical skill to extract a bullet from her arm, John Kinzie proceeded to cut it out with his penknife A grave certificate of Captain Heald, a copy of which is still preserved, sheds light upon the medical care received by him in the weeks immediately succeeding the massacre It sets forth that while still a captive at St. Joseph he paid ten dollars to an Indian doctor for medical attendance. Ifowever crude these services may have been, the commander's lot was a happy one in comparison with that of some of his wounded

subordinates. Burns, a member of the ill fated Chicago militia, was stabbed to death by a squaw within an hour of the close of the battle, while several of the wounded regulars were tortured to death during the ensuing night.

With the return of the garrison to the site of Fort Dearborn in 1816, came Dr. John Gale, to remain here for the two ensuing years Soon after his arrival he was instrumental in bringing to light a story of one of the wounded survivors of the massacre of 1812 which constitutes as strange a bit of historical flotsam as was ever snatched from the oblision of the past. Because of the way in which the tale has been handed down to us, its historical accuracy cannot be vouched for by the writer, yet it possesses enough of interest to justify its inclusion here In October, 1816, two of the men detailed to select timber for the construction of the fort were proceeding in a skiff far up the North Branch, when they came upon a half-concealed Indian hut. They were first apprised of its proximity by the shrill shricks of the squaws, who had perceived the boat as it approached. The men were turning the boat to retreat, when they heard the voice of a white man imploring them to stop and talk with him. He informed them he was a member of the old Fort Dearborn garrison He had been wounded in the battle, but his life was mercifully saved by an elderly squaw, whom he had often provided with something to cat She prevented the Indians from scalping him, and with the help of her girls moved him across the river and put him under some bushes. Here the women cared for him as best they could, attending to bis wounds, although both they and he suffered much from lack of food As soon as he could be moved they tied him on a flat tumber from the burned fort and dragged him to a small lake, some forty miles to the northward Here he found himself compelled to take the old squaw for his wife or perish from starvation Upon her sudden death, a year before the visit of the sawyers, he had taken the two older girls to be his squaws There was a third sister, younger

comprised the inmates of the hut The sawyers reported their discovery at the fort, and the next day Dr Gale accompanied them to the hut, taking a load of presents for the squaws. It appeared that the inmates of the hut were about to remove to another location, and as a preliminary to this the soldier had taken the youngest girl to be his third wife. She was then 150 moons, or 13 years old, but had desired to be married before leaving the vicinity of her mother's butial place

than these, and the three women and himself

Dr. Gale examined the man's wounds and found that they had healed, but with unnecessarily poor results, one leg being shortened and one arm of little use. The surgeon took down his name and other personal details and listened to his story of the massacre. He refused to return to civilization as long as the squaws would live with him and care for him; but he promised, on condition that the little squaw should not be ridiculed by the soldiers, to bring them to visit the encampment. Nothing more was ever seen of the man, however, a fact not much to be wondered at. The surgeon wrote out an account of the interview and left it with the adjutant, by whom in some manner it was lost story did not, like the wounded soldier, pass into complete oblivion, is due to the fact that it was at length written down by a student of local history, after having been preserved in memory for

over three quarters of a century In June, 1818, Gale was promoted to the full rank of surgeon and transferred to another station. He was followed at Fort Dearborn by Dr McMahon, whose service was terminated about a year later by ill health The next surgeon on the roster of the Fort Dearborn garrison was William S Madison, but within two months he was ordered to Louisville, and the scanty post returns do not establish clearly whether he was ever in fact at Fort Dearborn at all Like Van Voorhis, Madison gave his life for his country, being killed by the Chippewa Indians in May, 1821 In September, 1821, came surgeon M. H T Hall, but like Madison his connection with the garrison ceased after a term of two months In July, 1821. came a namesake, Dr Thomas P. Hall continued at Fort Dearborn until the garrison was withdrawn and the post abandoned, in September, 1823. During these years the post commander was Lieutenant-Colonel John McNeil During the war of 1812 he had twice been brevetted for gallant conduct, the first time in the battle of Chippewa, the second in the battle of Niagara. Mrs. McNeil was a half-sister of Franklin Pierce, the future president of the United States. Another member of the official family at Fort Dearborn during Dr. Hall's incumbency as surgeon was James Watson Webb, who in later life acquired a threefold fame as politician, diplomat, and journalist

A glimpse at the daily life and amusements of these pioner: Chicago surgeons may prove of interest to their successors of the great metropolis of to-day. They shared, of course, with the other members of the garrison, the hardships and privations of life incident to their isolated wilderness station. Perhaps the most obvious fact about the fife at Fort Dearborn, down at least to the first withdrawal of the garrison in 1823, is that of its overpowering loneliness. From November to May the settlement was as isolated from the world at large as though on another planet. One day in October, 1817, Samuel A. Storrow, who was making a tour of the Northwest, appeared on the north bank of the Cheago River and shortly afterwards entered the fort. Its immates, he relates, received him "as one arrived from the moon."

Necessarily, then, the inhabitants of the little settlement must ordinarily rely upon themselves for social intercourse and relaxation The diversions of the garrison were naturally but few. Fishing and hunting, and an occasional athletic contest with the Indians who visited the fort, constituted the chief outdoor amusements From the first discovery by the French until far into the nineteenth century the region around Chicago was a perfect hunter's paradise When Cooper came to Fort Dearborn in 1808 the officers and most of the civilians of the place possessed horses and dogs Cooper himself had two good saddle horses and a hunting dog Within a week of his arrival some dogs chased three deer past the fort into the river A young soldier, who chanced to be in a canoe without any weapon, sprang into the water as the deer were swimming past, caught one by the neck, and held its head under water until it was drowned Cooper's dog seized the second, but the third, a large stag, gained the north bank and escaped.

We are indebted to Cooper, too, for the story of an athletic contest at Chicago, the description of which stirs the blood even after the lance of a hundred years Lieutenant William Whistler was a splendid specimen of physical manhood, over six feet in height and noted for his strength and powers of endurance. Among the tawny neighbors of the Fort Dearborn garrison was a Pottawatomie chief of similar physique and about the same age as Whistler. He was a great runner, and enjoyed the reputation of never baving suffered defeat in a race. A five-mile foot race hetween the two men was arranged, Whistler wagering his borse and accoutrements against the borse and trappings of the chief. Much interest. of course, was aroused over the contest. Both the Indians and the soldiers were confident of the prowess of their respective champions. The red men staked their ponies and other available property on the chief, and the whites accepted the wagers as fast as offered. The contest, which was witnessed by several hundred Indians and the

entire garrison and settlement, was won by whistler by a margin of a few yards, after a superb struggle. The final sequel of the race, according to the same authority, came several years later and was still more thrilling. During the War of 1812 the same chieft, now serving with the Birtish, sent a chillenge to individual comlait to Captain Whistler or any officer or sudder of his command. The challenge was promptly accepted by Whistler himself, and the outcome of the envaling hand to-hand combat with kink, sword, and tomahask, was the departure of the

warrior for the happy hunting ground The recollections of James Watson Webb of his life at Fort Dearborn in the early twenties show the garnson officers of that period to have been furious hunters Webb describes rather minutely the hunting expeditions in which he shared Doctor Hall maintained a pack of twenty for hounds, and so was dubbed "master of the hunt " We learn, however, from the historian of Major Lung's expedition to the source of the St. Peter's River, which passed through Chicago in 1823, that his devotion to sport did not preclude an interest in scientific pursuits. In treating of the characteristics of the Pottawatomic Indians the author acknowledges his indebtedness to a "saluable manuscript of abservations" communicated to him hy Dr. Hall, and especially emphasizes the value of the medical portion of his notes

For the years following 1833 the walls of Lot Dearborn failed to choo to the sentinel's tread and for the same period of time the inhalitants of the little Chicago settlement missed the familiar boom of the sunrive and sunset gun The abandonment of Lot Dearborn proved premature, however, the Indians of Wissonism became restive, and in 1838 a serious outbreak was averted only though the numrabable energy and resourcefulness of Governor Cass. Vectoriling the order went fourth for the roccupation of 10 Dearborn, and in October, 1838, the new garrison arrived

The post surgeon from this time until December, 1830, was Dr C A I inley. The precursous ness of postburnous fame is well illustrated by the treatment accorded him at the hands of our local historians, but one of whom, apparently, has been aware even of the surgeon's existence. Hyde, his "Larly Medical Chieago," merely alludes to him as "Dr J. B Finley." Hurlbut decotes serial pages of his "Chieago Antiquities" to the correction of errors in Hyde's wor. He fads to note, however, the missdentification by I fide of Dr. Finley, although reference to the army register makes it plain that J B I linley could never the missdentification have the surgeon of the properties of the surgeon of th

have served at Chicago He entered the army in 1844 and left it the following year; thus the entire period of his service falls between the distruction of the first Fort Dearborn and the establishment of the second. From the same source we lear that Dr. C. A Finley, the real Fort Dearborn surgeon, continued in the army until 1867, and in March, 1855, was brevetted brigadier-general "for long and faithful servery."

Perhaps the most interesting period from the medical viewpoint in the history of Fort Dearborn was the summer of 1832. The outbreak of the Illack flank War filled the white inhabitants of northern Illinois with consternation, Paniestricken, they made a wild rush for places of safety, and I ort Dearborn became the haven of refuce for several bundred settlers from the surrounding country. State and national covernments moved with praiseworths sigor against the Indians, and soon General Winfield Scott was approaching Chicago with many hundred regulars drawn from various points along the Atlantic scalmard With him came, however, a peril before which the menace of the hostile red man paled to insignificance The Asiatic cholera had recently erosed the Atlantic to Canada From Queliec it sucpt down upon New York by way of the St Lawrence and Hudson River valleys, and gradually extended thence to west and south over the country The pestulence fell with awful fury upon Scott's army during its voyage around the lake, and, more potent than flinck Hawk's warriors, for a time disrupted the expedition. On Scott's own vessel no fatalities occurred until Mackinac had been passed and Lake Michigan entered Then the disease broke out suddenly and with fatal veolence. The only surgeon on board became panie stricken, drank a bottle of wine, and went to bed sick, and, to quote the disgusted commander s grim comment, "ought to have died " In this crisis Scott himself turned doctor, applying as best he could the treatment which, in anticipation of the plague, he had sought instruction upon before he left New York As soon as the vessel reached Chieggo the troops in possession of Fort Dearborn moved out and the fort was converted into a general hospital for the use of Scott's men The settlers who had recently crowded into the settlement now engaged in oute as wild a stampede to get away

Meanwhile the pestilence raged among Seott's stricken troops at Fort Dearborn. The official medical report shows that 200 cases were admitted to the hospital in the course of six or seven days, and that 58 of them terminated latally Apparently the terror inspired by the cholera was due as much to the rapid progress of the disease as to the high percentage of mortality among its victims On Scott's vessel men died in six hours after being in perfect health Sergeant Heyl "was well at nine o'clock in the morning - he was at the bottom of Lake Michigan at seven o'clock in the afternoon" The author of the statement just quoted gives a graphic account of his own illness, from which at the time of writing he was in process of recovery. He was serving as officer of the day when Scott's ship reached Chicago, and superintended the landing of the sick on board "I had scarcely got through my task," he wrote two days later, 'when I was thrown down on the deck almost as suddenly as if shot. As I was walking on the lower deck I felt myself growing stiff from my knees downward I went on the upper deck and walked violently to keep up the circulation of the blood I felt sud denly a rush of blood from my feet upwards, and as it rose my veins grew cold and my blood curdled. . . My legs and hands were cramped with violent pain

Some interest attaches to the methods em ployed by physicians in treating the disease, especially in view of what transpired at Chicago In general it may be said that on both sides of the Atlantic the medical profession was helpless to stay its course. The surgeon who attended Scott's men in Fort Dearborn, who was probably Dr. S. G J Dc Camp from New Jersey, treated all cases by calomel and blood-letting. This proved so efficacious, according to his report, that he regarded the disease as "robbed of its terrors" In view of the nature of the remedies employed, and the fact that 58 of the 200 cases admitted to the hospital terminated fatally, the grounds for this satisfaction are not entirely clear But few fatalities occurred among the members of the Fort Dearborn garrison, who had been removed some distance from the fort and were attended by another physician, Dr Harmon Curiously enough, he attributed his success to the fact that he did not employ calomel in the treatment of the disease. That some of the patients in the fort were subjected to other treatment than the calomel and blood-letting described in Dr De-Camp's report stems evident from the statements of the officer whose sudden seizure on board

Scott's vessel has been described. He was given eight grains of opium, and made to rub bis legs as fast as he could, he was also required to drink a tumbler and a half of raw brandy. At the time of writing the patient described himself as "out of danger," but whether because of this treatment it would be hazardous to affine.

With the close of the Black Hawk War a flood of settlers poured into the country lying west of Lake Michigan The increase of population at Chicago in the single year 1811 was many times as great as during the entire 160-year period which had clapsed since Marquette's visit to the place. Necessarily the Indian population of Illinois and Wisconsin retired before the advancing tide of settlers, and it soon became merely a question of time when Fort Dearborn would be abandoned by the soldiery for all time. The withdrawal took place on almost the last day of the year 1816. The last surgeon at Fort Dearborn Dr Philip Maxwell, was on duty during practically all of the four year period flis term of service, thereforc, was longer than that of any of his predecessors except Dr Smith. Maxwell had an attractive personality. "He was straight and portly in figure six feet and two inches in height, two hundred and seventy five pounds in weight," yet he was fond of dancing and "his step was as light as that of a wap of a glrl" Before coming to Lort Dearborn Marnell had been stationed in Wisconsin, and while there became acquainted with the country in the neighborhood of Lake Geneva fts beauty so impressed him that he later purchased an entire township of land there and established a beautiful home. He continued in the army for several years after the abundenment of Fort Dearborn in 1836, serving for a time under General Zachary Taylor in Louisiana At length he resigned his commission and established himself in Chicago, now a flourishing city. Here he continued, an honored practitioner and citizen, until his death in November, 1859 Although he died comparatively early, he had lived to see the sprawling village of half a hundred flimsy houses to which he came in February, 1833, become the greatest city of the interior - a more wonderful transformation, perhaps, than any that has since occurred on the site of old Fort Dearborn

SURGICAL CLINICS

COMMITTEE. A. J. OCHSNER, Charman, CARL BECK, FREDERIC A. BESLEY, and LAWRENCE RYAN,

Monday, November 10th

A I J OCHSNER - Augustana Hospital - 8 to 1 JAMES J McGUINN — Columbus Hospital — 10 to 12 SYLVAN LUNZ — German Hospital — 10 to 12 A P HEINECK - Jefferson Park Hospital - 10 to 12 G H WYNEROOP - Lake View Hospital - 10 to 12 BENJAMIN H BREAKSTONE - Marmonides Hos

pital — 10 to 12
WYLLYS ANDREWS — Michael Reese Hospital —

EMANUEL FRIEND - Michael Reese Hospital - 9 CARL BECK - North Chicago Hospital - 9 to 11 EMIL G BECK - North Chicago Hospital - o to 11

Bismuth work only DAHL - Norwegian Deaconess Hospital - 9 to 11 M L HARRIS - Polichnic Hospital - 11

NORMAN KERR — Policlinic Hospital — 11

J R PENNINGTON — Policlinic Hospital — 2 to 4

ARTHUR DEAN BEVAN — Presbyterian Hospital — 11 to 1

C G BUFORD — St Joseph's Hospital — 2 CARL WAGNER — St Joseph's Hospital — 10 to 12 W H ALLPORT — St Luke's Hospital — 2 T 'A DAVIS — West Side Hospital — z to z EDWARD M BROWN — West Side Hospital — 8 to zz T J CONLEY — West Side Hospital — so to 12 I V FOWLER — Willard Hospital — 31 to 12

Tuesday, November 11th

N M PERCY — Augustana Hospital — 8 to 20 C G BUFORD — Children's Memorial Hospital — 2 JACOB FRANK - Columbus Hospital - 8 to 12 LAWRENCE RYAN - Cook County Hospital - 8 to 11
A G ZIMMERMAN - German Hospital - 9 to 12 PAUL GRONNERUD - German Hospital - 10 to 12 BENJAMIN II BREAKSTONE - Jefferson Park Hos-

C I WYNEKOOP - Lake View Hospital - 8 to 10 BENJAMIN II BREAKSTONE - Maimonides Hosoital -- to to 12

WYLLYS ANDREWS - Mercy Hospital - 8 to 10 L A GREENSTELDER - Michael Reese Hosp tal - 8 L McARTHUR - Michael Reese Hospital - o to 11

N EISENDRATH - Michael Reese Hospital - 9

EMANUEL FRIEND - Michael Reese Hospital - 9

CARL BECK - North Chicago Hospital - 9 to 11. EMIL G BECK - North Chicago Hospital - 9 to 11 Bismuth work only

WM, R CUBBINS - Post-Graduate Hospital - 2 to 6. WM. R. CUBBIND - Post-Braculate Hospital - 7 to 6. DEAN D. LEWIS - Prestyternan Hospital - 9 to 11 CHARLES II PARKES - Sherndan Paik Hospital - 8 C. II McKENNA - St. Joseph's Hospital - 9 to 11. C. M. McKENNA - St. Joseph's Hospital - 9 to 12. A.E. HALSTEAD - St. Lucke's Hospital - 9 to 11. AXEL WERELIUS - South Shore Hospital - 9 to 12 E. SCHROEDER - Wesley Hospital - 8 to 10 F. A. BESLEY -- Wesley Hospital - 10 to 12

E E. HENDERSON - Frances Willard Hospital -

Wednesday, November 12th

A. G ZIMMERMAN - Alexan Brothers Hospital -

J. OCHSNER - Augustana Hospital - 8 to 1 WM FULLI'R - College of P and S - 1 to 3.
WM M. HARSHA - College of P and S - 1 to 3 CARL BECK -Cook County Hospital - 1 to 4.
SYLVAN KUNZ - German Hospital - 10 to 12. B A McBURNEY - Hahnemann Hospital - 10 30 J V FOWLER - House of Correction - o to rr. E TORELL - Lake View Hospital - o to to G II WYNEKOOP - Lake View Hospital - 10 to 12 BENJAMIN II BREAKSTONE - Marmonides Hospital

- 10 to 12 B MURPHY - Mercy Hospital - 8 30 to 12 WYLLYS ANDREWS - Michael Reese Hospital -

EMANUEL FRIEND - Michael Reese Hospital - 9

CARL BECK - North Chicago Hospital - o to 11 R PENNINGTON - Policlinic Hospital - 2 to 5. AWRENCE RYAN - St Anthony's Hospital - 10 to

CARL WAGNER — St. Joseph's Hospital — 10 to 12
A D HALSTEAD — St Luke's Hospital — 8 to 11
CHARLES DAVISON — University Hospital — 1 to 3 A P HEINECK - West Side Hospital -- 8 to 10

Thursday, November 13th

N M PERCY — Augustana Hospital — 8 to 10 A. J OCHSNER — College of P and S — 1 to 3 N. M PERCY — College of P and S.— 1 to 3 JACOB FRANK — Columbus Hospital — 8 to 12 JAMES J McGUINN - Columbus Hospital - 10 to t2 LAWRENCE RYAN - Cook County Hospital - 8 to

E WYLLYS ANDREWS - Cook County Hospital - 9

A P HEINECK — Cook County Hospital — 1 to 3 A G. ZIMMERMAN — German Hospital — 9 to 12 PAUL GRONNERUD - German Hospital - 10 to 11 H R CHISLETT — Hahnemann Hospital — 8.30 C E KAHLKE — Hahnemann Hospital — 8.30 C L WYNEKOOP - Lake View Hospital - 8 to 10
BENIAMIN H BREAKSTONE - Maimonides Hos-

pital - to to ra

CARL BECK - North Chicago Hospital - 9 to 11 EMIL G BECK - North Chicago Hospital - 9 to 11 Besmuth work only

WM F SCOTT - Oak Park Hospital -- 10 to 12 M L HARRIS - Polichnic Hospital - 11 NORMAN KERR - Policlanic Hospital - 11

ARTHUR DEAN BEVAN - Presbyteman Hospital -CARL B DAVIS -- Presbyterian Hospital -- 11 to 1

C H McKENNA—St Joseph's Hospital—10 to 17
C G BUFORD—St Joseph's Hospital—2
A E HALSTEAD—St. Luke's Hospital—8 to 11 W. II ALLPORT - St Luke's Hospital - 2

AXEL WERELIUS - South Shore Hospital - 9 to 12 D. A. K. STEELE - University Hospital - 1 to 3 F. A. BESLEY — Wesley Hospital — 4 to 6.

H. M. RICHTER — Wesley Hospital — 4 to 6.

C. C. ROGERS — Willard Hospital — 10 to 12

Friday, November 14th

A G. ZIMMERMAN - Alexian Brothers Hospital o to zz.

A J OCHSNER - Augustana Hospital - 8 to 1 EDWARD M BROWN - College of P & S - 1 to 3 F. A BESLEY — Cook County Hospital — 10 to 12
A E HALSTEAD — Cook County Hospital — 10 to 12 GEORGE F THOMPSON - Cook County Hospital -

8 to 10 SNLVAN KUNZ — German Hospital — 10 to 12 G H WYNELOOP — Lake View Hospital — 10 to 12 BENJAMIN II BREAKSTONE - Maumonides Hos-

pital - to to 12 E. WYLLYS ANDREWS - Mercy Hospital - 8 to 10 L A GREENSFELDER - Michael Reese Hospital -8 to 10

L McARTHUR - Michael Reese Hospital - o to 11 D N EISENDRATH - Michael Reese Hospital -9 to

EMANUEL TRIEND - Michael Reese Hospital - 9 to 12
CARL BECK — North Chicago Hospital — 9 to 12
J. R. PENNINGTON — Polichnic Hospital — 2 to 4
DOUGLAND DESCRIPTION HOSPITAL

CHARLES J ROWAN - Presbyterian Hospital - 11 CARL WAGNER — St Joseph's Hospital — 10 to 12

M J SEIFERT — St Mary's of Nazateth Hospital —
8 to 10

W E SCHROEDER - Wesley Hospital - 8 to 10. ALLEN B KANAVEL - Wesley Hospital - 4 to 6. T I CONLEY - West Side Ifospital - 10 to 12.

Saturday, November 15th N M PERCY - Augustana Hospital - 8 to 10

F. G. DYAS - College of P. and S - 1 to 3 JACOB FRANK - Columbus Hospital - 8 to 12. WYLLYS ANDREWS -- Cook County Hospital --

© to 12 C E HUMISTON - Cook County Hospital - 10 to

PAUL F MORF - Cook County Hospital - 1 to 4. A G ZIMMERMAN - German Hospital - o to 12 II R CHISLETT - Hahnemann Hospital - 8:30

E KAHLKE - Hahnemann Hospital - 8 30 1 WYNEKOOP - Lake View Hospital - 8 to 10. H A MOJE - Lake View Hospital - 10 to 11 BENJAMIN II BREAKSTONE - Maimonides Hos-

pital - 10 to 12 B MURPHY - Mercy Hospital - 8 30 to 12 CARL BECK - North Chicago Hospital - o to 11 EMIL G BECK - North Chicago Hospital - 9 to 11.

Besmuth work only S DAHL — Norwegian Deaconess Hospital — 9 to 17
PAUL GRONNERUD — Policlinic Hospital — 2 to 4. D W GRAHAM - Presbyterian Hospital - 2 to 5. W II ALLPORT - St Luke's Hospital - 2
AXEL WERELIUS - South Shore Hospital - 0 to 12

W E SCHROEDER - Wesley Hospital - to to 12 Days and Hours to be Announced JAMES BURRY - Illinois Steel Co Hospital C PLUMMER - St Luke's Hospital

GENITO-URINARY SURGICAL CLINICS

COMMITTEE LOUIS E. SCHMIDT, Chairman, WM T BELFIELD ROBERT II HERBST, GUSTAV KOLISCHER, VICTOR D. LESPINASSE

Monday, November 10th

GUSTAV KOLISCHER - Michael Reese Hospital -9 to 11 L W BREMERMAN - Office -4 to 6

Tuesday, November 11th

HERMAN L KRETSCHMER - Alexan Brothers Hospital - 8 to 10

B C. CORBUS - College of P and S - 8 to 10 HARRY A KRAUS - German Hospital - 4 to 5 W BREMERMAN - Lakeside Hospital - 8 ROBERT H HERBST - Polichnic Hospital - 4 to 6

Wednesday, November 12th

L. L. SCHMIDT - Alexan Brothers Hospital - 9 to 11 F. KREISSL - Jefferson Park Hospital - 2 to 3 GUSTAV KOLISCHER - Michael Reese Hospital o to II

L W BREMERMAN -Office - 4 to 6

Thursday, November 13th

L W BREMERMAN - Lakeside Hospita! - 8 ROBERT H HERBST - Policlinic Hospital - 4 to 6. J S NAGEL - West Side Hospital - 3 to S.

Friday, November 14th

HERMAN L KRETSCHMER - Alexan Brothers Hospital - 8 to 10 D N EISENDRATH AND FRENCH S CARY-Col-

lege of P & S - 2 to 4 HARRY A KRAUS — German Hospital — 4 to 5.

I KRIISSL — Jeffervon Park Hospital — 2 to 4.

LOUIS E SCHMIDT — Michael Reese Hospital — 9 to

B C CORBUS - Post Graduate Hospital - 3 to 6.
WM T BELLTIELD - Presbytenan Hospital - 4

L W BREVIERM IN -Office -4 to 6

Saturday, November 15th L W BREMERMAN - Lakeside Hospital - 8

V. D LESPINASSE - Wesley Hospital - 3,30

GYNECOLOGICAL AND OBSTETRICAL CLINICS

COMMITTEE J. CLARENCE WEBSTER, Chairman, Frank T. Andrews, Charles S. Bacon and Thomas J. Waters

Monday, November 10th

ILENRY BANGA — Polichent Hospital — 10.

THEODORE J DOEDERLIN — Germas Hospital —

TRANK T ANDREWS — Mercy Hospital — \$ to 10

EMIL RIES — Post-Graduate Hospital — 6

EMIL RIES — Post-Graduate Hospital — 6

ARTHUR H (CHRIS — Mecky Hospital — 10

ROHERT T GILLMORE — Welky Hospital — 10

MARK T GOLDSTINK — Welky Hospital — 10

MARK T GOLDSTINK — Welky Hospital — 10

Tuesday, November 13th

CAREY CULBERTSON — Rush Medical College — 11
W M THOMPSON — St. Joseph's Hospital — 9
PHILIP S. DOANL — St. Joseph's Hospital — 2.30
W S. DARNES — Wesley Hospital — 3

Wednesday, November 12th

HENRY F. LEWIS — Cook. County Hosputal — 3 po LESTER FRANKENTHAL — Mithes! Reser Hosputal FRANN. W. LYNCH — Presbyteran Hosputal — 21 to 1 J. CLARENCE. WEBSTER — Presbyteran Hosputal — 11 STROYTHEANEY — Ruch Medical College — 11 C. DUDLEY — 51. Lude's Hosputal — 9 ARTHUR H. CURTS — Westy Hosputal — 9 MIRK T. GOLDSTIVE — Westy Hosputal — 10 30

Thursday, November 13th

A B KEYES — Cook County Hospital — 3 to 4 GLIBERT H WYNEKOOP — Lake Vice Hospital — 2 to 4 FRANK T ANDREWS — Mercy Hospital — 8 to 10 C V BACHELLE — Polichar Hospital — Afternoon

FRANK T ANDREWS — Mercy Hospital — 8 to 20 C. V BACHELLE — Polichine Hospital — Afternoon HENRY BYGA — Polichine Hospital — 20 CHANNING W BARRETT — Polichine Hospital — 20 WM B FEHRING — Rush Medical College — 11 PHILIP'S DOANE — St. Joseph's Hospital — 2 30 W. S. BARNES — Mero, Hospital — 3. ROBERT T GILLMORE — Wesley Hospital — 10 THOS I WATKINS — Wesley Hospital — 0

Friday, November 14th

A B KEYES — Policlane Hospital — 3 to 4.

ALBERT GOLDSPOHN — Post Graduate Hospital —

11

CAREY CULBERTSON — Rush Medical College — 11

W M THOMPSON — 5L Joseph Hospital — 0

Salurday, November 15th

LESTER FRANKENTHAL — Michael Resse Hospital
FRANK W LYNCH — Presbyterian Hospital — tr to 1
J CLARENCE WEBSTER — Presbyterian Hospital —
11
N SPROAT HEANEY — Rush Medical College — 11
THOS 1 WATKINS — Wesley Hospital — 0

Days and Hours to be Announced

ERNEST STURENHAUS—West Side Hospital GEORGE SCHMAUCH LS SIMON—Michael Reese Hospital HERBERT MARION STOWE BERTHA VAN HOOSEN—West Side Hospital

ORAL SURGICAL CLINICS

COMMITTEE TRUMES W BROPHY, Chamman, THOMAS L GRADER and WM 11 G LOGAN

Days and Hours to be Announced Later
THOMAS L. GILMER—St. Luke a Hospital and Northsevern University Dental School
SCHUR D. BLACK—St. Luke's Hospital and Northsevern University Dental School
TM. S. G. DOGAN—Thous Willard Hospital.

TRUMAN W. BROPHI — Presbyteran Hospital and Francis Wallard Hospital HERBERT A POTTS — Northwestern University Dental School FREDERICK B MOOREHEAD — Presbyteran Hospital

OPHTHALMOLOGICAL CLINICS

COMMITTEE WM H. WILDER, Chairman, EDWARD V L. BROWN and CASSILS D. WESTCOTT

Monday, November 10th Friday, November 14th

WILLIS O'NANCE - Illinois Charitable Eye & Ear

Infirmary -- 2 30
G W. MAIIONEY -- Polichnic Hospital -- 9
W. FRANK COLEMAN -- Post-Graduate Hospital -- 4
WILLIAM H. WILDER -- Rush Medical College --2.30

Tuesday, November 11th

CHARLES II BEARD --- Illinois Charitable Eye & Ear *Infirmary - 2 30 ALFRED N MURRAY - Lake View Hospital - 1 to 3 CHARLES II FRANCIS - Polichme Hospital - o GEORGE F. SUKER - Post-Graduate Hospital - 9

Wednesday, November 12th

J B LORING - College of P and S - 3 OSCAR DODD - Illinois Chantable Eye & Ear In-

firmary = 2 30

S MEAD HAGER — Polichinic Hospital — 9

W. FRANK COLEMAN — Post-Graduate Hospital — 9

GEORGE F SUKER — Post-Graduate Hospital — 2

Thursday, November 13th WM H WILDER -- Illinois Charitable Eve & Ear

Hospital - 2 30 G W. MAHONEY - Polichine Hospital - 9.

H W WOODRUFF - Illinois Charitable Eve & Ear Hospital - 2 to ALFRED N MURRAY - Lake View Hospital - 1 to 3 CHARLES H FRANCIS - Polichnic Hospital - o W IRANK COLLMAN - Post-Graduate Hospital - 4.

Saturday, November 15th

E V L BROWN -- Histors Charitable Eye & Ear Hospital - 2 30 S MEAD HAGER - Policlinic Hospital - 0 GEORGE I' SUKER - Post Graduate Hospital - 2

Days and Hours to be Announced Later

C GURNEE FELLOWS - Habnemann Hospital RICHARD J TIVNEN — Mercy Hospital MORTIMER PRANK — Michael Reese Hospital E. F. SNY DACKER — Michael Reese Hospital BROWN PUSEY — Northwestern University and Wesley Hospital

CASEY A WOOD - St Luke's Hospital FRANK ALLPORT - St Luke's Hospital CASSIUS D WESCOTT - St Luke's Hospital WAI F GAMBLL - University Hospital

LARYNGOLOGICAL AND RHINOLOGICAL CLINICS

COMMITTEE PREDERICK MENGE, Chairman, WM I BALLENGER, and JOHN COWN RHODES.

Monday, November 10th

STANTON A FRIEDBERG -- Cook County Hospital CHARLES M. ROBERTSON — Polichisc Hospital — 2 30 to e

Tuesday, November 11th

JOSEPH C BECK — Cook County Hospital → 3 to 6 OTTO T FREER — Polichine Hospital — 4 to 5 CHARLES II LONG — Post Graduate Hospital — 8 30 to 12

Wednesday, November 12th

BURTON HASELTINE - Hahnemann Hospital afternoon OTTO J STEIN - Post Graduate Hospital - 2 to 5 FREDERICK MENGE - Wesley Hospital - 8 to 12

Thursday, November 13th

JOSEPH C. BECK — Cook County Hospital— 3 to 6.
RICHARD H BROWN — College of P and S — 9 to 11

CHARLLS M ROBERTSON - Polichnic Hospital -2 30 to 5 CHARLES H LONG - Post-Graduate Hospital - 8 30

to 12 Friday, November 14th

STANTON A FRIEDBERG - Cook County Hospital OTTO T FREFR - Policlinic Hospital - 4 to 5 WM L BALLENGER - College of P and S - 10 to 12

Saturday, November 15th

JOSEPH C BECK — Cook County Hospital — 3 to 6 CHARLES H LONG — Post-Graduate Hospital — 8 30 ARTHUR M CORWIN - West Side Hospital - 8,30.

Days and Hours to be Announced Later

FRANK E BRAWLEY - St Luke's Hospital. MORTIMER FRANK -- Michael Reese Hospital I HOLINGER - St Elizabeth's Hospital GEORGE P MARQUIS - St. Luke's Hospital IOHN E RHODES - Presbyterian Hospital.

ORTHOPEDIC CLINICS

COMMITTEE E W. RYERSON, Chammar, Wallace Blanchard, Charles M. Jacobs, John L. Porter and Henry B Thomas

Monday, November 10th

E W RYERSON - Children's Memorial Hospital-3 to 6, Polichnic Hospital - r to 2. THOMAS P. LYNAM - Home for Destitute Crippled Children - 2 to 4

Tuesday, November 11th

JOHN L PORTER - College of P. and S - 9 to 11, Home for Destitute Crippled Children - 11 to 1 WALLACE BLANCHARD - Home for Destitute Crippled Children - 2 to 4

Wednesday, November 12th

E W RYERSON - Children's Memorial Hospital - 3 to 6, Policlanic Hospital - 1 to 2

B MAGNUSSON - Home for Destitute Crippled

Children-2 to 4

Thursday, November 13th

HENRY B THOMAS - Cook County Hospital - 11 to E. W. RYERSON - Home for Destitute Crippled Children - 2 to 4

Friday, November 14th

WALLACE BLANCHARD - Home for Destitute Crippled Children - 2 to 4

E. W RYERSON - Polichmic Hospital - 1 to 3

Saturday, November 15th C M JACOBS - Home for Destitute Coppled Children - 2 to 4

OTOLOGICAL CLINICS

COMMITTEE NORVAL II PIERCE, Chairman, J HOLINGER and GLORGE F SHAMBALCH

Monday, November 10th

IRA FRANK — Michael Reese Hospital — 9
JOSEPH BECK — North Chicago Hospital — 3 to 6
J GORDON WILSON — Northwestern University Mech cal School — 10

J HOLINGER — St Joseph's Hospital — 9

'T MELVILLE HARDIE — St Luke's Hospital

Tuesday, November 11th JOSEPH BECK - County Hospital - 3 to 6 If H BOETTCHER - Illinois Eye and Ear Infirmary - 2

DAVID FISKE - Policlinic - 2 30 FRANK ALLPORT - St Luke's Hospital - 2 Generil eye, ear, nose and throat chine

Wednesday, November 12th

1 HOLINGER - Alexan Brothers Hospital - o JOHN T CAVANAUGH - Chicago Fye, Ear, Nose and Throat Hospital - 3 to 6 NORVAL II PIERCE - Illinois Eye and Ear Infirmary IOSEPH BECK - North Chicago Hospital - 3 to 6 O I STEIN - Post Graduate Medical School - after noon

FRANK ALLPORT - St Luke's Hospital - 2 General eye, car, nose and throat clime

Thursday, November 13th DAVID FISKE - Children's Memorial Hospital - 1 to 3 IOSEPH BECK - Cook County Hospital - 3 to 6

ALFRED LEWY — Hahnemann Hospital — 2 30
CHARLES II ROBERTSON — Polichnic — 2 30
IRA FRANK — Michael Rette Hospital — 9 J HOLINGER—St Joseph's Hospital—9
A II ANDREWS—Wesley Hospital—morning

Friday, November 14th

W. A. BALLENGER - College of P & S - 10 to 12 H. H. BOETTCHER - Illnois Eye and Ear Infirmary IOSEPH BECK - North Chicago - Hospital - 3 to 6 DAVID FISKE — Polichnic — 2.30
GEORGE D SHAMBAUGH — Rush Medical College, Sena Hall- 2 FRANK ALLPORT - St Luke's Hospital - 2 Gen-

Saturday, November 15th

eral eye, ear, nose and throat clinic

I HOLINGER - Alexan Brothers Hospital - 0 IOSEPH BECK - Chicago Eye, Ear, Nose and Throat Hospital — 3 to 6 JOHN A CAVANAUGH — Chicago Eye, Ear, Nose and Throat Hospital - 3 to 6 GEORGE W BOOT - Children's Memorial Hospital — 1.30 NORVAL H. PIERCE — Illinois Eye and Ear Infirmary CORDON WILSON - Northwestern University Medical School - to

SURGERY, GYNECOLOGY AND OBSTETRICS

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ORTHOPEDIC PRINCIPLES IN THE TREATMENT OF ABDOMINAL VISCEROPTOSIS AND CHRONIC INTESTINAL STASIS¹

BY JOI L E GOLDTIM AIT, M D, BOSTON

THE justification for the orthopedist having concern with the subject of visceroptosis is to be found in the following facts

- 1. Abdominal viscoroptosis is mvariably, associated with disturbances of poise, which must result in weakness of the muscles and strain of the joints. The joint strain is manifested chiefly in the feet, knees, sacrolliac joints and low back, and shoulders. When the congenital type of viscoroptosis evists, the disturbance in poise shows even in childhood.
- 2 The imperfect poise associated with visceroptosis results in a gradual weakening of the trunk muscles, with consequent lessening of this part of the support for the trunk as well as for the viscera
- 3 The imperfect poice, commonly showing as the droop of the shoulders and flattening of the chest, must of itself cause downward displacement of the abdominal organs, with possible interference with their function, even though the formation of the organs, together with their ligaments, was wholly normal in the beginning
- 4 Many of the chronic joint diseases are probably due to the disturbed physiology resulting from the malposition of the viscera as well as possibly to absorption from the gastrointestinal tract

- 5 Treatment of the joint strains resulting from the postures associated with isceroptosis, as well as the treatment of the joint diseases, due to disturbances of the abdominal viscera, is incomplete, and many times hopeless, unless the viscera are properly treated so that undue strain is relieved and their normal function made possible
- 6 The best health and greatest efficiency of the individual is possible only when the body is used in such poise that there is no undue strain or interference with any of the structures
- In the presentation of a paper upon this subject it is hardly necessary before such a gathering as this to enter into the discussion of the different types of viscoroptosls more than to mention the fact that there are the two general types, the congenital and the acquired, and that in both of these types will be found many variations in the size, shape, or general formation of the special viscus.

To understand the general principles which underlie the work of the orthopedist it is necessary to know something of that which takes place in the postures assumed in such cases.

When the human figure is held fully erect (Fig. 1), the chest is raised, the ribs are

*L T Swains Study of Thirty \ne Cases as Regards [stestinal Leagth and Nutrition Boston M & S J Aug 27, 2012



Fig t

flared at the bottom the diaphragm is high, and there is a very considerable space under the ribs in the abdomen in which the stomach liver and spleen lie, almost covered by the lower border of the ribs Not only is there ample space for these organs, but when these organs are held in place there is ample room for the other viscera in the lower portions of the abdomen In this position the muscles of the abdomen are contracted so that the abdominal wall is firm and there is the best possible support in the front and sides for the various viscera Also, in this position, with the abdominal muscles tight and with the abdomen flat the total depth of the abdominal cavity at the level of the last lumbar vertebra represents only about one third of the full depth of the body (Fig 2), and this depth is practically the same all the way across, the lateral spinal spaces being filled with the wings of the ilia, the psoas muscles, and the retroperitoneal fat Above this point the cavity rapidly deepens and the

lateral spinal spaces are free for the viscera, The kidneys are almost entirely posterior to the anterior portion of the spine (Fig 3). while the liver fills much of the lateral spinal space on the right side. If the body is erect the kidneys are so placed in the lateral spinal spaces, surrounded by the retroperitoneal fat (Fig 4), that their inclination is backward and upward so that there is no tendency to fall forward or sag downward Also when the body is fully erect the liver is held in place partly by the kidney and the retropentoneal fat below, but very considerably by the grasp of the lower ribs with the spine (Fig 5). entirely apart from the support which it receives from the hollow vi-cera and its suspensory ligaments.

If the body droop (Fig 6), the shape of the addominal cavity changes at once. The ribs are necessarily inclined downward, and since the anterior part of the ribs, is below the costo-retebral articulations, it is inevitable that in the downward movement there is a corresponding backward movement there is a material tessening of the space under the ribs, with the effect that the upper abdomen is made much smaller than normal. In this position, since the disphragm is attached to the anterior portion of the ribs, it must also the anterior portion of the ribs, it must also

move downward These two elements, the downward movement of the diaphragm and the contracting of the space under the ribs, mean that the liver and the stomach are crowded downward into other positions. In such an attitude not only are the ribs flattened and the diaphragm lowered, but since the support of the body is thrown almost wholly upon the posterior muscles, the abdominal muscles are relaxed This being the case (Fig 7), the abdomen protrudes or becomes prominent anteriorly with the effect that not only is there less support for the organs but that the depth of the abdominal cavity is materially changed. with the result that all of the organs tend to assume a lower level. In this downward movement or droop of the body, since the posterior attachments of the diaphragm are so low that they come down well behind the upper part of the kidneys, as the diaphragm is







Liz & (Dwight)

lowered the kidneys are necessarily dragged forward at the top. To still further affect the position of the kidneys, since the liver rests parily upon the right kidneys, and since undoubtedly there is some pressure from the stomach upon the left kidney as these organare forced downward the kidneys are formed downward also. The continued pressure of the organs from above upon the kidneys naturally results in the absorption of the fat tissue surrounding them, and this portion of their support is taken away.

In this downward displacement not only are these organs affected, but since the colon, if it has its normal attachment is attached at the hepatic angle devertly under the liver, in the downward desplacement, the movable portion of the colon must be forced downward with the effect that the angle is made sharper and very possibly may be shut off as the result of the force of the downward pressure

On the left side a similar condition occurs as the result of the pre-sure or drag of the stomach against the left side of the transverse tooln, with a resulting interference with bumen at the splence angle. In this condition also the small intestine assumes a lower level, partly because of the relaxation of the anterior abdominal wall and partly because of the pressure from above

When the body is fully erect the axis of the addominal cavity should be almost at a right angle with the axis of the pelvic cavity. In the droop of the body, however, the axes are

changed so that the thrust of the viscera of the abdomen can be received much more directly into the pelvis

The pressure which such displacement of the miestines must mean upon the organ of the pelvis is perfectly obvious the possible result being not only interference with the function of the organs by the direct pressure, but by pressure upon the vessels and nerves supplying them

With such an understanding of the relationship of the organs in the different positions it is at once obvious that if a kidney is sutured in place, and the shape of the body which was responsible for the displacement of the organ is allowed to remain, the result will be most unsatisfactory, the same condition being certain to recur The same thing is true in regard to the operations which are performed commonly upon the stomach and intestine. which must fail in much of their possibility of benefit unless at the same time the body is remodeled so that the normal relationship of the other parts is restored. It should also be apparent that frequently the fixing of an organ in place makes the adjustment of the organs as a whole more difficult than before This has been strikingly shown in a case which the writer had great difficulty in relieving in which the splenic flexure and the hepatic flexure of the colon had been sutured in place in a patient who had had a congenital ptosis with a free mesentery on all the organs. The two fixed points, with the natural drag of

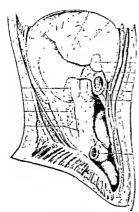


Fig 4 (Corning)

all the other loose organs upon these two fixed points, naturally makes greater difficulty in the passage of the waste around these angles than existed before. It is perfectly evident to the writer that many of the cases of surgery and medicine which now represent a reproach to our profession are unsatisfactory because only the purely local element has been appreciated in treatment. If the profession could be made to see that a displaced stomach or a displaced colon or a displaced kidney or the imperfect working of any special organ has its relation to all of the other parts, and should be considered in connection with the other parts, many of the cases which are now perplexing would be easily understood, while many of the cases which are justifiably operable would yield results far different from those now obtained



Fer 5 (Sabotta)

TREATMENT

The ideal which the orthopedist has in the treatment of such conditions is to restore the body as nearly as possible to the normal poise, in which the proper relationship may exist in all its parts. In this he fully appreciates that it is impossible to change the general shape of the special organ or the general character of the figamentous attachments. In other words, if the congenital type exists, that type must always exist. He appreciates, however, that the best function of an imperfect organ,



Its 6. Typical attitude of consental visceral pures Note the downward inclination of the ribs, the backward inclination of the loody from the hips.

Fig 7 Miltude, congenial visceral pures More extreme than Fig 6 Note downward melination of the ribs backward inclination of the body narrowing

as well as the best lunetion of a perfect organ cannot take place unless all acquired or un necessary interference is removed. It is well known to those who have given special study to this subject that even when the congenital type cities, there patients rarely have symptoms in early life indicative of visc-ral flaturbance. The symptoms which have developed latter are undoubtedly due to the increase of the downward displacement of the organ or the peculiarity in its formation which must come from the long continued use of the body in the upright position. Since Nature's plan is to repair damage, it is reasonable to expect that the relief of the stram which

of the upper distorate prominence of the lower addomenting. Some patient as Lip of Photograph taken months later. Note the width of the lower part of the thorse the rites having been ruised as the result of the month of the lower part of the beautiful of the lower part of the brace an addominal padistic held to give support over the lower ablormen.

resulted in such symptoms will be followed by improvement, with the retraction of the visceral figaments, exactly the same as takes place in a relaxed joint with the removal of strain

It is felt by the writer both from general reasoning as well as from extensive experience, that a good prognosis is usually possible in such conditions if the acquired features of disturbance of pure and visceral sag can be overcome.

The correction of the poise or the remodelling of the body is at times comparatively simple and can be accomplished by the use of simple apparatus and special exercises without



Fig. 9. Same patient as Figs. 6 and 7 showing the jacket with the body hyperextended the ribs raised to their maximum. This position was impossible in the beginning and was accomplished by several different jackets



Fig. 10. The hyperextended position. Note the position of the pillon at the dorsolumbar functure, with the marked prominence of the antenor portion of the lower ribs.

interfering with the active life of the individual, but at other times the condition is so severe that more radical measures are nec-

Whenever the disturtance of poles in such cases has been long evistent not only is the relationship between the bones changed, but there is a marked change in the muscle tone of the body. The anterior muscles of the trunk weaken as the result of disuse, since in this postion the strain is thrown almost wholly upon the muscles of the back, with the result that there is a gradual weakening of these back muscles. To attempt to improve the position of the body by exercises alone with such a muscular condition present means increasing the muscle weakens, with a dis-

tinct interference with the general recovery, The first step, therefore, is to rest the parts which have been overstrained and to stimulate the parts which have been weakened from disuse This at times can be accomplished by the use of a brace (Fig. 8), which not only has for its purpose the relief of the strain to the spinal muscles, but also the correction of the poise, the elevation of the chest the forcing of the lower ribs forward and upward and furnishing support for the pelvis and the lower part of the abdomen. While this apparatus is being worn, massage, stimulating bathing, etc , are all of advantage in hastening the renair. As soon as the evidences of mucle fatigue have passed, active evercises should be started with the idea of gradually strength-



Fig. 11 The prone hanging position



Fig. 1: The same patient as Fig. 6 taken before treatment was started showing the marked hollow in the lumbar remon, due to the absence of the retroperational fat. Also note the change in the position of the ribs brought about by samply assuming this povume.

ening all the muscles of the trunk so that ultimately the poise of the body can be maintained without artificial aid. The brace at such times is gradually omitted, the pelvic belts and lighter supports being substituted for varying periods.

In the severer cases recumbency a absoluteby necessary and since in such cases considerable visceral disturbance may take place as the result of the recumbent posture care must be taken that the body is so held that this tendency is made as little as possible. The common experience that the nights are times of much distress, with disturbed sleep much gas in the bowel, abdominal pain, the dragged lecling in the morning, with the weak pulse and the subnormal temperature, finds explanation if the anatomic formation is considered,

To prevent the sag of the organs which must occur as the muscle relieves disappear in sleep, a leather jacket should be used which is modded from a cast of the body taken when the body is fully extended and with the ribs fully raised. Such a jacket (Fig 9) is worn during the night and in such a jacket the patient is allowed to move about or change from back to side or face at will, knowing that whatever position is assumed, harmful interference with the viscera is reduced to the minimum. The quality of the sleep resulting from such support is at times in striking conforms uch support is at times in striking con-

trast to the quality existing before the apparatus was applied

In the severe cases recumbency is insisted upon both day and night at times for periods of many weeks, this being necessary partly because of the faulty position of the ribs, with the retraction of the ligaments at both the costovertebral and vertebral articulations With the body horizontal, the downward sag of the organs is naturally relieved, but it must be remembered that sag in other directions may be quite as harmful in the function of the organs as occurs when the patient is The attacks of vomiting when the patient is kept for long upon the back, with the many and irregular painful abdominal conditions, usually find an anatomic explanation and are usually relieved by change of The position insisted upon in the posture daytime is with the patient upon a flat bed. with not more than one pillow under the head. preferably none at all, with a small pillow under the back to prevent the backward sag of the lumbar spine, or with the jacket above described, with frequent changes of position to the side or face. Occasionally the foot of the bed is raised to still further assist gravity in the replacement of the organs hyperextended position (Fig 10), in which the diaphragm is raised to the extreme, should be taken for at least a half hour after each of the meals, when the stomachic digestion is



Fig. 13. The same patient as Fig. 6, showing the potture four months after the beginning of the treatment is the patient still wearing the brace, over which is fixed a proper corset the corset making firm pressure over the lower proper of the abdomen, but leaving the upper abdomen and lower rubs entirely free.

most active Besides this, either the kneechest position or the prone hanging position (Fig. 11), should be taken at intervals, not only to raise the diaphragm and elevate the ribs, but also to allow the abdominal organs to sag into the upper part of the abdomen If the stomach has had difficulty in discharging its contents into the duodenum, because of its low position, not infrequently the mere assuming of the knee-chest position or the prone hanging position is sufficient to relieve the difficulty Not only is this true, but usually such positions are followed by improvement in the function of the intestine, so that not only is that part of the digestion carried on better, but the interference with the movement of the bowel is markedly lessened.

In such cases, as part of the bad postures, the ribs are narrowed at the bottom, producing an acute angle at the border of the costal cartilares. The recumbent position and the special positions with the apparatus should be continued until the lower rits have not only been raised, but until they have flared sufficiently to change the costal angle from an acute angle to at least a right angle, if not an obtuse angle. This at once assures the space in the upper abdomen under the rib in which normally the stomach and liver lie

The recumbent treatment should be maintained also until the general nutrilition of the body has improve d sufficiently for the retro-peritoneal fat, which is almost entirely lacking (Fig. 12) in the extreme cases of the congenital ptosis, to be replaced This can easily be determined by palpation through from front to back, in the loin and over the lateral solinal spaces.

When it is considered wise for the patient to go about, a brace (Fig. 8) is worn at first, and if the patient is a woman, over this a carefully fitted corset (Fig. 13) is also worn Special exercises are given for the purpose of increasing the muscle tone, and as the strength increases the brace is omitted, the pelvic bell with low abdominal support being substitut

ed With women this is needed for only a few weeks, after which a corset fitted to give firm support over the pelvis and low abdomen, with no constriction of the upper abdomen or low ribs, is all that is required With men, the pelvic belt should be worn until the muscles are fully strong and the understanding of the correct poise is so perfect that there is no tendency to acquire the bad postures Supervision of such a case should naturally be continued at intervals for a long time for the purpose of preventing relapses Patients should be made to understand the harm of hadly fitted costumes and the great care that should be taken at all times to see that, whatever the occupation, the body is not allowed to flex "in the middle," the bending which may be necessary being at the hips, the trunk as a whole being kept straight.

If such an understanding of the subject is held, the writer feels that not only is the prognosis good in many of these cases now considered hopeless, but that such understanding offers opportunities of team work between the physician, the surgeon, and the orthopedist that shows our profession at its best.

THE THYROID AND PARATHYROID PROBLEM¹

BY JASPER HALPENNY, M A. M D. C. M., WINNIFEG Lecturer in Surgery, Manitoba Medical Coll go, Surgeon to Munipey General Hospital

"HOUGH there has been a great deal of progress made during recent years in the thyroid and parathyroid problem, the time has not yet arrived when positive statements can be made with reference to all of the phases of the question. In spite of the fact that large numbers of cases of goiter are being treated surgically with more or less beneficial results, it seems quite safe to predict that the ultimate solution of the problem has not been reached. Furthermore, during the last five years, owing to the many reports of experimental work in the case of the parathyroids, these glandules have occupied the attention of surgeons and others possibly too much.

Regarding the etiology of enlargement of perverted secretion of the thyroid gland we are still in doubt. Probably the most direct evidence during recent years is that given us by Chambers (1) and McCarrison (2). Before the British Medical Association, Chambers reported as follows: "Many attempts have been made to find evidence of organism infection. Several hundred sections have been made in some cases, and have been treated by various methods for showing organisms in tissues. Bacteriological examination, including animal inoculation, has been made in a few cases. The results have been entirely negative. Nevertheless, the histological characters suggest a toxic substance present in the thyroid gland - in some cases diffuse, in others localized. As to the nature and origin of this substance, we are at present entirely in the dark."

In 1000 McCartison reported his work in India. Water from a known goitrous well was filtered through a Berklett house filter. The filtrate was given in quantities of four ounces in milk each morning before breakfast to six healthy young men between 18 and 20 years of age. During the experiments all six were kept under the closest observation in order to avoid errors. Five of these developed

goiter, and one of them was subsequently cured by means of thymol. McCarrison himself was the subject of the next experiment. He had resided in a goitrous district for five years without any enlargement of the thyroid gland. Water for his house was obtained from a well notorious as a non-goiter-producing water. Care had been taken by all Europeans to avoid the disease. Each morning before breakfast, during the experiment, be consumed half a tumblerful of the Kashrote water suspended matter, prepared in the same way as in the preceding experiment. At the end of fifteen days the neck bad increased 2 cm in size, and there was found to be uniform enlargement of the thyroid gland. experiment was continued nine days longer. during which time the gland fluctuated somewhat in size. At one time he was hardly aware of the presence of the enlargement. while at another, and especially at night, it gave him distinct discomfort.

Following this experiment, McCarrison next boiled the water and repeated the experiments both on himself and seven other men. with entirely negative results. He then concludes that goiter is due to matter suspended in water, and that this matter is not mineral but a living organism. Moreover, McCarrison adds additional color to his theory that thyrold in his district is due to an infection. because he reports 68 cases of goiter cured by the administration of thymol. "The main action of this drug," he says, "is a local one in the intestine, owing to the fact that in the absence of oil, alcohol, or other of its solvents it is very sparingly absorbed. Its curative action is very strong, though not conclusive. evidence that the habitat in man of the organism responsible for the production of golter is the intestinal tract." He goes on to say that "further evidence on the point is afforded by the differential blood counts in cases of the disease. I have found eosinophilia of 8.9 per cent as an average of sixtyfive cases which I have examined by this method."

Short (3) does not agree, however, that such evidence as this points strongly in favor of infection. He says, "It is quite in accordance with the common laws of nature to find a metal or mineral specially fimited to a particular geological formation in widely separated areas, but there is no evidence that bacteria are dependent on geology; and it has recently been shown by numerous observers that the waters of a goiter well retain their power to cause goiter in rats after filtering out all bacteria by a Berkfelt filter, but not after heating to Soo C. The heating probably precipitates the metal as an insoluble carbonate, by driving off the earbon dioxide, which it holds in solution."

Thus, Short rather holds the view that goitrous water owes its goiter-producing qualities to minute traces of some metal having a great afinity for rolline, and forming with it

an insoluble compound

As was intimated at the commencement of this paper, the thyroid problem is intricately woven into the parathyroid problem. Despite the positive statements of many experimenters, voiced by Tuholske (4), who says the generally accepted view is that "After the removal of the thyroid gland the parathyrolds never change structurally, never get like, never resemble thyroid tissue, and never assume its functions," it would seem wise to withhold judgment before accepting such positive views. Thompson and myself (5) showed a series of illustrations in which the thyroid after parathyroideetomy closely approximated the histological structure of the parathyroid after thyroidectomy. That is to say, after the parathyroids are removed the thyroid is changed in histological appearance to be somewhat intermediate between normal thyroid and parathyroid. Similarly, the parathyroid, after thyroidectomy, loses its typical appearance, and in place of the solid columns forming the normal parathyroid, definite vesicles appear, some of which contain colloid material. There is marked hypertrophy of the whole gland as well.

Furthermore, the question becomes more complicated still, for evidence is at hand to show that probably the pituitary gland and the thyroid may act vicariously for one another, or at least that they may have a function more or less common to one another. As Short says, "Oversecretion of the pituitary gland, as we shall see, results in overgrowth of the bones, and may lead to gigantism. On the other hand, inadequate thyroid secretion will stunt the growth of bones, as is seen in cretinism." In addition to this clinical evidence, histological changes observed also give even stronger evidence. After thyroidectomy in rabbits, Herring (6) reported as follows: "Remarkable changes are at once apparent in the posterior lobe of the pituitary gland. and particularly that portion of it which lies next to the pars intermedia. Masses of a colloid nature lie among the cells and fibers of the pars nervosa. In the neck of the posterior

fobe the colloid is even more plentiful."

Rogowitsch (7), Vasalle and Generali (8),
and Edmunds (9) also found that the pituitary

acts vicariously for the thyroid.

In work recorded elsewhere the author (ro) reported changes found in the plittary of a dog after parathyroidectomy. In this case the animal lived till the thirty-third day and died in convulsions. The pars intermedia of the plittiary gland showed distinct and numerous veiteles which histologically resembled normal thyroid. The vesicles were lined with a regular circle of epithelia cells precisely as in the thyroid; the colloid contents seemed to be of the same character as in the thyroid.

Thus we see that there is considerable evidence to show that the thyroid, the parathyroids, and the pituitary gland have some features in common, and that they may to some extent act each for the other. And the problem becomes even more complex when we view the research work of the various investigators. Rogers makes out a strong case in favor of an intimate relationship, both physiological and pathological, between the thyroid, the pancreas, and the adrenals. experiments and his interpretation of them are very convincing From his findings he seems quite justified when he says, "Apparently goiter or symptoms referable to the thyroid may occasionally be entirely secondary to

other disturbances, and the superficial deformity seems often to be only a hypertrophy which is compensatory to a failure elsewhere."

Even with this evidence all before as we are compelled to admit that much still remains to be learned about these glands. Though this uncertainty is very disquieting from a clinical standpoint, it is wise for us as surgeons to refrain from allowing ourselves to dogmatize to such an extent that our surgical treatment is based on errors etiological, physiological, and pathological.

It is assumed by most writers that exophthalmic goiter is due to a hypersecretion of the thyroid gland. This view is probably correct, nevertheless, our knowledge of the internal secretion of this gland is still very deficient The exceedingly careful article of Carlson and Woelfel (11) on this subject tends to emphasize the paucity of definite facts. They have shown that the lymph production in the normal thyroid is slight, and that it is increased in all types of enlargement of the gland. They state, however, that there is no relation between the iodine content of the gland and the lymph production. Furthermore, they were unable to find any difference between the common neck lymph and the lymph of goiter, except that the latter contains pure lymphocytes. They made chemical tests for iodine in the thyroid lymph with negative results, intravenous injections of thyroid lymph in dogs, both with and without anæsthesia, produced negative results. Complete climmation of the thyroid and parathyroid lymph for forty-eight hours in normal foxes gave negative results. The whole role played by iodine is still an open question They conclude their article with this paragraph.

"We have as yet no undoubted or adequate test for the thyroid-parathyroid secretions in the body fluids. When such tests are discovcred, it will in all probability be found, in virious of what is now known concerning the distribution and paths of all their internal secretions, that these secretions are more concentrated in the blood than in the lymphs, and that they enter the blood directly, rather than indirectly through the gland lymphatics."

Another method of approach, of course, is the one adopted by Reid Hunt (12) and many others, viz: a chemical analysis of freshly removed glands. The majority of these observers have directed their attention to a determination of the iodine content of the thyroid gland in health and disease. The most recent and correct determination is possibly that of Riggs (r.3). He found on an average 0.3 mg of iodine per grain of the gland substance. In the thyroid of Graves' disease, however, this is decreased to 0.2 mg, or even less than 0 r mg, and the less iodine per grain of the gland, the more severe the

symptoms are, as a rule. Rogers' analysis of the gland bas been undertaken from a different viewpoint. He has been able to isolate two entirely different substances, each more or less free from the other One of these he terms a "nucleoproteid," which he supposes represents the epithehal portion of the gland. The other he terms "globulin," which represents the collord. Regarding the action of these two substances there seems to be very marked physiological differences shown between them. If ten to fifteen minims of a 1:1000 solution of the human thyroid nucleoproteid is injected subcutaneously into a normal individual at intervals of a couple of hours, it invariably and soon produces tachycardia, accelerated respiration, cutaneous flushing, slight elevation of temperature with a subjective feeling of heat, sweating, tremor, insomnia, and a sensation of nervousness. When thyroid globulin is injected subcutaneously into a normal individual in the same dosage as the nucleoproteid. there seems to be little or no effect except a feeling of well-being, and a very large amount must be administered and for a much longer time, to obtain the characteristic signs of thyroidism

This faithful attempt at a complete analysis will, as Ochsner (15) says, no doubt essive side and ultimately to a complete knowledge of the chemical and physiological features of the thyroid secretion. In view of these findings it would seem well, for the present, to still hold open minds as to whether there is a hypersecretion or a perverted secretion. True, the numerous pathological reports such as Wilson's (10) regarding the reduplication of the basement membrane in the vesicles in the gland, with the accompanying change in the epithelium found in exophthalmic goiter, suggest increased or hypersecretion, also the known beneficial results in partial thyroidectomy suggest the same answer. Still, until we have some definite demonstration of the secretion itself and of the increased amount secreted in Graves' disease, we cannot hold the problem to be settled.

Again, the complexity of the relationship existing between Graves' disease and myxeedema tends rather to cast doubt over the generally accepted theory rather than to elear the situation. True, my xeedema occurs in the absence of the thyroid gland. In 408 cases in Kocher's clinic, complete extirpation of the gland was followed by myxodema in 69 cases Experimentally Horsley (17) and Edmunds (18) claim to have produced mild myxadema in monkeys Munk (19) and Vincent and Jolly (20), however, were unable to confirm these findings Gunn and myself (21) also reported elsewhere a series of experiments on the monkey with negative results.

Clinically, many factors are thought to have a bearing on the production of goiter. Temporary enlargement of the thyroid is known to occur during menstruation and pregnancy Stengel (14) also points out that tremor, pulpitation, rapidity of heart action. and fullness of eyes occuring occasionally in anamia are due to hyperthyroidism. thinks this is true also of certain circulatory disturbances and also certain nervous conditions In Graves' disease fright is held to be a common cause. A review of the various eauses assigned, from a chnical standpoint, would probably be merely a recital of occasions when an already existing Graves' disease became so aggravated that the patient's attention was directed to it or a simple goiter took on the graver form It would be well for us in taking the histories of our cases to keep this point in mind

TREATMENT

Amongst the various forms of treatment at the present time, the most spectacular is removal of part of the gland Various forms of medical treatment are recommended and they are chiefly directed toward counteracting or eliminating the supposed excessive secretion Various forms of diet are also prescribed with the object of decreasing the secretion. One is probably right in stating that at the present time the chief drug which seems to have directly beneficial effects is quinine hydrobomate. X-ray, radium, injections of both water, and carbolic acid also have their enthusiastic advocates. These, honever, are established on an entirely empirical basis. McCarrison's administration of thymol, however, is based on what to himself seems a rational foundation—that goiter, as he finds it in India, is due to a micro-organism.

The administration of iodine and the commercial preparation of thy roid extract is, in the light of our present knowledge, not to be recommended, though it may be ultimately proven that the primary enlargement of the thyroid gland in many cases is due to the elfort of the gland to gather more iodine from the blood. It does not follow from clinical experience that the administration of fodine is beneficial. Thyroid extract, if It contains all the essentials of the gland, can only be useful after the case has passed over from being one of Grave's disease to the condition of myxodema.

The most rational treatment, possibly, which has been presented so far is the subcutancous injection of Rogers' serum. This observer seems fairly justified when in refering to this treatment, he says. "This scrum seems as specific and beneficial in its effects on the symptoms of acute toxamic thyroidism as is the antitoxin on those of diphtheria; but the convalescence is protracted, and after the subsidence of the acute symptoms the antithyroid serum must not be 'pushed' unduly. In acute exacerbations of chronic thyroidism it must be used with eaution, and not beyond the period at which it seems beneficial In the usual chronic case of exophthalmic goiter, except when the blood pressure is high or above 150 mm, of hg., it is slowly benencial, and often curative when administered at intervals of two or three days and continued for weeks or months. It cannot with safety be administered oftener than once in twentyfour hours, and if at any time at the end of two or three days it has intensified

rather than alleviated symptoms it should be stopped."

· During recent years, in the surgical treatment of goiter, particularly of the exophthalmic variety, the chief advances have probably been made by Crile (22) of Cleveland and Dunhill (22) of Melbourne. The most painstaking and exhaustive work by Crile and his associates has shown that the elimination of fear by the administration of morphin and scopolamin prior to the giving of the general anasthetic has reduced in their hands the number of devitalized brain cells very materially. The use of nitrous oxide in place of ether has also reduced the devitalized cells to one quarter. This work is recorded from their experimental laboratory. Crile's now famous method of anxisthetizing the national with Graves' disease in such a way that the patient does not know that the anæsthetic is being given has been a great advance. The use of nitrous oxide in place of other is also undoubtedly of immense value

Dunhill's work is probably the most remarkable ever recorded. He does not use a general anæsthetic Local anæsthesia is gained by using seven ounces of 2 1000 novocain With this all the tissues of the front of the neck are well infiltrated The most remarkable feature about his work, however, is that he operates on cases showing the most advanced muscular changes, including very badly weakened hearts. In fact he refuses practically no cases He emphasizes particularly the need for operating gently, without any crushing of the tissues. Keeping in mind the fact that he refuses practically no case, his operative results are indeed remarkable had four deaths in 380 operations of all classes, of these 230 being of the exophthalmic variety.

The value of ligation of the vessels of the thyroid gland without removal of the latter has clinical evidence to support it

In conclusion, one is compelled to admit that there is still a very great deal to be learned. The relationship between the thyroid and parathyroid glands and other of the ductless glands is still one of the unsolved physiological problems Clinical knowledge has made some advances, but after many gropings in the dark, many steps thought to

be thoroughly scientific have been taken on some false assumption or some premature experimental finding thought at first wellfounded However, in spite of our lack of knowledge on many points, clinically, we know that perfect rest of body and mind is of great value. This, of course, merely gives the patient a chance to cure himself, and after all, that is exactly what modern treatment does in the major part of tuberculous conditions

The surgical treatment of goiter, both of the simple and exophthalmic varieties, in the light of chnical evidence chiefly, is appropriate in many cases Rogers' serum ranks as one of the greatest advances However, even in the hands of its originators it has not fulfilled expectations It has a field to fill, and that field has not yet been defined clinically. We must look for further light before its use can be considered specific.

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CHRONIC INTESTINAL STASIS¹

BY W ARBUTHNOT LANE, M S. LONDON, FACUND Sutgree to Goy's Il-sectal

HIL subject of chronic intestinal stasis which has been chosen as the basis of this discussion, is one in which I have been intensely interested for many years. When I first began to draw the attention of the profession to the great part played in the life history of the individual by a delay in the passage of material along the alimentary tract, and drew a parallel between the human digestive canal and a drainage system, my observations were treated as being the fantasies of a vivid imagination. Later. when the accuracy of these observations was being tested in the field of hard fact, the more progressive observers began to realize that my premises were not so fanciful as was at first supposed. Now, the subject of chronic intestinal stasis, and its disastrous sequelæ, is occupying the attention of the profession more completely every year. Those who were inclined to scoff at the suggestion of the need for any operative treatment of such a harmless and everyday condition as simple constipation are now beginning to realize that the operations which I have devised are in reality directed against a most serious condition in which constipation in itself plays but the part of a common and by no means essential symptom. To many members of our profession constipation apparently means merely the absence of a daily action of the bowels, but what I mean by chronic intestinal stasis is an abnormal delay in the transmission of the intestinal contents through some portion or portions of the gastro-intestinal

tract, which delay may be accompanied by constinution or by a daily or even more frequent action of the bowels.

What is intestinal stasis from a commonsense point of view, freed from the bias of a creed which has been instilled into us in our medical infancy? The gastro-intestinal tract is a living, sentient, drainage scheme, of which the several portions perform several functions, from which nutrient material is picked up by absorbing vessels, and into which certain organs discharge their contents. In some portions organisms thrive normally, in others the presence of the same organisms produces poisonous products which that segment of the tract is unaccustomed to deal with. These poisons, being absorbed, damage the tissues of the body, causing them to degenerate and reducing their capacity to combat successfully organisms which may invade them. Any delay in the passage of the contents of this drainage scheme has a threefold result on the organisms found in the intestine. Their multiplication is facilitated, they extend beyond the limits of their normal habitat, and extraneous strains are developed. These organisms may extend along the ducts of the organs which open into the drain pipe, and they or their products, carried in the blood stream, may infect organs which do not directly communicate with the intestine, for example, the kidneys,

The excess of these poisons circulating through the body cannot be dealt with effectually by those organs whose business it is to render them as innocuous as possible. They produce progressive degenerative changes in every tissue and a very definite and unmistakable series of symptoms results.

The liver and other organs which convert the toxins, the heart and vessels which convey the products of conversion, and the kidneys and organs which eliminate them, all show after a time distinctive evidences of overwork, which, when they produce symptoms, are regarded as separate entities and are called diseases. In common with all the other tissues of the body, these structures suffer from being nourished with more or less impure blood, and their textures are injured in consequence. I need hardly call your attention to the remarkable confirmation of my views which are afforded by Carrel's magnificent work in the growth of tissues He shows that death of tissues is due to an inability to eliminate waste products and that by draining them effectually and supplying suitable nutrition he gives them immortality.

The changes undergone in intestinal stasis by the ductless glands open up a vast field of interest. The part played in the suprarenal glands for example, assuming that our idea of their function is correct, must be a most important one. Nothing can be more striking than the pigmentation of the skin which occurs in stasis, or its abrupt disappearance when the supply of poison has been stopped. A patient who has been coppery or mahogany colored for years, will resume an appearance of health within a few days of the removal of the large howel The comparative rarity of fatal cases of so-called Addison's disease is a striking instance of the capacity of these wonderful little organs to hold their own under difficult conditions Again what are the mechanics of the general low temperature, which is especially to be noted in the extremities of those patients who are the subjects of chronic intestinal stasis? Is its purely a cardiac matter, or do the ductless glands play an important part?

The rapidity with which this low temperature disappears, and the color and feel of the extremities improve after ileocolostomy, is even more striking than the removal of pigment from the skin, often taking merely a few hours. We are but touching the fringe of a most important subject, and it is one which the surgeon, if he will cease to be satisfied with treating end results in a routine manner, has more opportunity of elaborating than the physiologist or physician.

The nervous system is also markedly affected in intestinal stasis, and as an illustration of this fact, I would call your attention to the case of a woman suffering from tic douloureux who had been sent to me from South Africa for removal of her Gasserian ganglion She had suffered severely from this trouble for eight or nine years, and during the last two years her life had been intolerable, in that she experienced constant pain exaggerated by several violent agonizing outbursts during the day. Never having been able to satisfy myself that the excision of this ganglion is a scientific operation. I refused to perform it in the circumstances. I found. and my opinion was supported by the X-ray examination, that she was suffering from marked stasis and she stated that she obtained more relief from purgatives than any other medical treatment. We short-circuited her, and for a week after the operation she continued to have pain in the right side of her face, but without exacerbations pain disappeared completely on the eighth day Excepting that she had a slight attack of pain at the end of the fifth week, her progress was marvelous, in that her general health improved rapidly, her weight increased and a smiling, happy, bright expression replaced one of the most miserable and hopeless imagin-This case merely shows in an exaggerated manner the effect of autointoxication on the nervous structures, and as I have frequently observed it in a lesser degree and have cured it by removing the stasis, it points again to the fact that it is better and more scientifie to treat primary causes than to deal with end results.

Need I remind you of the degenerative changes in the breast associated with stasis, and which disappear if the drainage scheme be properly dealt with, but which if left alone not infrequently terminate in cancer? When I first pointed this out it was ridiculed by a number of surgoons, but I see that it is rapidly becoming accepted by many observers who have confirmed it by pathological evidence.

There are many other conditions, such as the several changes in the thyroid, which are in my opinion the results of chronic intestinal stasis and which are very possibly in certain stages better treated by removing the primary cause than by dealing with the end results. By doing this not only is a progressive disease cured, but the general nutrition and health of the patient are vastly and steadily improved. I refer here not only to evaphthalmic goiter but also to adenomatous growths in the thyroid.

Such are the results of delay; what then are its causes? Obstruction in the drainage scheme may occur in the first place at the points of normal fixation, or in the second place the intestine may become kinked by acquired bands, etc., which, formed in the first instance by nature with the object of facilitating drainage, may have later come to

cause very material obstruction. There are several sites in the length of the alimentary tract at which this obstruction may occur, and I would first direct your attention to the mode of control of the contents of the duodenum by the kinking which occurs at the junction with the jejunum. It is somewhat difficult to determine what is meant anatomically by the duodenum, since it varies in its arrangement, but I shall regard the first mobile portion of bowel as jejunum. The vertically placed termination of the duodenum is firmly secured to the root of the transverse mesocolon. From this point in normal conditions the jejunum forms a gentle curve allowing of the free passage of the contents of the duodenum into the small bowel. II, however, there be any marked stasis of the contents of the small intestine due to control of the ileal effluent, the commencement of the jejunum is pulled vertically downwards in such a manner that the duodeno-jejunal junetion is obstructed by a kinking and also by a twisting of the bowel, and the effluent is controlled proportionately.

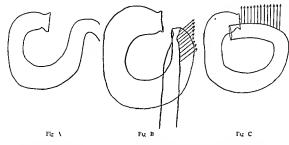
If the condition of obstruction be advanced, a new mesentery running from the outer aspect of the jejunum outwards and upwards to the structures in the immediate vicinity is found to have been formed. This mesentery is obviously the crystallization of resistances which tend to support the weight of the jejunum, and by taking that weight directly off the duodeno-jejunal junction, prevents obstruction at that junction as far as possible. Whide this acquired ligament may be useful in its early stages, it finally opposes the normal functioning of this portion of the intestine much in the same way as does the acquired ligament that forms at the end of the iteum.

In order to obviate the development of this mechanical disability the commencement of the lejunum, by an evolutionary process, becomes attached by peritoneal bands from left to right to the under surface of the transverse mesocolon in such a manner that in its highest state of development the fixed boxel

forms an almost complete circle.

Between the normal condition at birth and this high evolutionary type all grades are found, each presenting a varying degree of disability. I have indicated diagrammatically in Fig. A what I believe to be the usual condition at birth; in Fig. B the condition commonly present in advanced duodenal obstruction in chronic intestinal stasis (the arrows indicate the acquired ligament, which represents the crystallization of lines of force, and which is frequently present and which is evolved to take strain off the termination of the fixed bowel); and in Fig. C the fully developed fixation of the jejunum to the under surface of the transverse mesocolon. The arrows in this diagram indicate the acquired mesenteric hands which are evolved to fix the bowel in this situation in order to obviate angulation at its termination and consequent interlerence with the effluent. The advantageous mechanical arrangement afforded by this last type may be imitated by suturing the jejunum to the under surface of the transverse mesocolon after the division of any such bands as are shown in Fig. B should they exist. It would seem impossible to cradicate from some minds the idea that these acquired bands and mesenteries are inflammatory in origin.

We see, therefore, that nature recognizes the advantages of a fixation of the first part of the jejunum to the under surface of the transverse



mesocolon so that it lies at right angles to the termination of the duodenum This rectangular fivation tends to obviate kinking at the duodeno-jejunal junction The surgeon unconsciously brings about the sam effect by his operation of gastro-enterostomy

The temporary relief that follows this operation when performed for ulcer of the duodenum is thus explained, since whether an anterior or posterior operation is chosen, the jejunum is so fixed that it can no longer exert traction on and so kink the duodenojejunal flexure. The so-called "no foop" operation affords the additional advantage of establishing an even greater strain on the beginning of the jejunum in a horizontal or upward direction The absence or presence of an aperture of communication is, I believe, a matter of no moment unless at a later period the duodenal ulcer should cicatrize and so obstruct the normal outflow from the stomach.

However, in the consideration of the question of duodenal obstruction and ulceration, it must be clearly borne in mind that the obstruction at the end of the duodenum is itself secondary to obstruction at the end of the ileum. The obstation of the duodenal obstruction by the fixation of the penum, therefore, in no way affects the obstruction at the duodenal obstruction of the logical penum, and the infection of the dammed back contents of the small intestine continues as before the operation. At the same time the operation has reduced the tension in the duodenum, and if the inflammation of the mucous membrane resulting from this distention has ended in ulceration, the ulcer heals

It is a striking fact in the examination of patients suffering from distention of the duodenum that tenderness over the duodenum is the only symptom observed by the patient, who is quite unconscious of the tenderness associated with the obstruction at the end of the ileum until his attention is drawn to it by the manipulations of the surgeon.

This duodenal tenderness is in my experience generally regarded by the surgeon as evidence of duodenal ulcer or distention of the gall-bladder; should be find on operation that neither condition exists, he removes the appendix, on the supposition, I presume, that even a normal appendix may produce this symptom. A fair proportion of patients on whom I have operated for chronic intestinal stasis have previously experienced this treatment, frequently at the hands of surgeons of great eminence. Such a mistake as this would seem to be unjustifiable with our present means of diagnosis. A surgeon has no right to operate until he has exhausted every possible means of diagnosis at his disposal. If expert X-ray evidence were obtained instead of relying alone on a digital

examination of the abdomen, a number of such mistakes could be avoided.

It appears to me that the point of greatest difficulty in the passage of material contents along the gastro-intestinal tract is through the last few inches of the ileum. This is particularly the case when the execum particularly the case when the execument in the illiar loss. In such cases, the delay in the plassage of material at the pelvic brimmay be very great, and indeed in one of my cases, Dr Jordan found on X-ray examination that the bismuth was delayed for 85 hours in the terminal coll of the ileum.

At the operation on this case there was no evidence of obstruction to the ileum in either of the more usual forms, namely by an acquired peritoneal band or by an appendix fixed in such a position behind the small howel as to control the passage of its contents. Now this form of simple obstruction, which cannot be recognized at the time of the operation, and which can only be determined by bismuth and X rays. I call the simple static variety, as opposed to the more obvious varieties which I have just mentioned These latter are readily recognized when the abdomen is opened, though the effect on the passage of the intestinal contents can only be gauged by bismuth and X rays. If with an uncontrolled ileal termination the delay may be very considerable, it will be obvious that a structure which by strain or pressure exerts apparently but a comparatively slight constricting influence on the lumen of the bowel may affect very materially the passage of material through it.

I will now pass on to a consideration of the sites of excessive absorption of towins from the gastro-intestinal tract. Since the profession has begun to study the subject of autointoxication in chronic intestinal stasis, it has been inclined to assume that the large bowel is the sole source from which these toxins are derived, and it has got into the habit of looking on stasis as being purely colonic.

In consequence of this, operations have been conceived chiefly with the object of facilitating the passage of material through the colon, and in this manner the chief site of absorption has been on erlooked and left untreated. This is largely due to Metchnikoff's views on the subject. He considers that if we had no large bowel we should live longer. This is perfectly true, as evidenced by the fact that the removal of the large bowel results in a marvelous improvement in the health and appearance of the individual and prolongs his life, but I would point out that this improvement does not prove that the colon is the chief site from which toxins are absorbed in excess. In believe the bulk of the absorption takes Indeed in a considerable proportion of case, I believe the bulk of the absorption takes place from the small intestine.

Stasis in the small intestine, with the associated injection of its contents by organisms to which it is unaccustomed, is not primary, but is secondary to stasis in the colon In other words, if it were not for the presence of the colon the conditions producing stasis in the small intestine would not arise. If the crecum did not become overloaded as a part of a colonic stasis, obstruction at the end of the ilcum would not develop. Consequently infection of the contents of the small intestine by extraneous organisms nould not occur, the duodenum would not be blocked by the drag of the small intestine obstructed at the end of the ileum, the mucous membrane of the duodenum would not inflame and ulcerate, the biliary and pancreatic ducts would not be infected, and obstruction to the outflow from the stomach with all its sequelæ would not occur.

with all its sequeue would not occur.

I hold that the extraordinary improvement that results from short-circuiting and from the disconnection or removal of the colon is due largely to the fact that the evacuation of the contents of the small intestine is facilitated by its introduction into the policitation of the contents by organisms which grow in the material stagnating in the large intestine cases abruptly. I do not wish to suggest that all absorption of towins takes place from the stomach and small intestine, but I consider that the traction therefore the colon plays an important, and I believe, the more important, part in this process.

How are these cases treated? They are given germicidal drugs, which would appear to me to act by diminishing the number and virulence of the offending intestinal organisms. I refer to such medicines as arsenic, iron, mercury, etc. Or they are supplied with organisms which are intended to antagonize the growth of deleterious organisms in the intestine, or vaccines of these organisms are injected into the circulation to effect the same purpose. Or they are given increasing amounts of irritating substances called purgatives, with the object of hastening the passage of the contents of the intestine, and so affording less time for infection of the contents by organisms and for the absorption of their products. Or they are cut off the use of such foods as decompose readily and produce poisonous material. Or they are given large quantities of water, to wash away as rapidly as possible the poisons that have been absorbed into the circulation and tissues They are massaged and exercised, in order to stimulate the intestinal contents to move on. They have their stomachs washed out when material is dammed back and decomposes. and they have the large bowel flushed by abundant quantities of water, frequently containing antiseptic or irritating material This represents the medical treatment and the essence of the so-called "cures" which frequently effect a temporary alleviation of symptoms. All these forms of treatment are tedious, dangerous and at the best only palliative. Much more benefit can be obtained by the use of pure liquid paraffin administered at regular intervals during the day. This substance has, as far as is known, no chemical action whatever; it cannot be absorbed in the human intestines, while it facilitates very materially the passage of the intestinal contents. The motions cease to be firm, and they are much less bulky than before, for the reason that the amount of organisms which forms a considerable pro-Portion of normal faces is greatly diminished. By the use of a spring support controlling the lower abdomen, any accumulation of facal matter in the fleum or in the cacum, or in a prolapsed transverse colon, is obviated as far as possible, while the pressure on the veins of the splanchnic area keeps the brain better supplied with blood and more capable of carrying on its functions efficiently.

This treatment is adequate, providing the mechanical obstruction produced by one or more kinks is not too great.

If this be so, and if confirmation be obtained by X-rays and bismuth, some surgical means must be adopted to correct the faulty drainage and its results.

Let us now consider the treatment of chronic intestinal stasis in which there is an imperfect ileal effluent associated with recurrent obstruction of the duodenum, and possibly ulceration of its first portion. This condition can be treated by putting the patient in the supine posture for a time. In this posture the obstruction at the end of the ileum is no longer effective, and the kinking at the duodeno-jejunal junction no longer exists. The duodenal tension is relieved, and the ulcer, should it exist, heals. The patient feels very well for a time. On returning to the usual habits of life the obstructions recur and their consequences reappear. Or the patient may be operated on and a gastroenterostomy performed During the period the patient is in bed the ileal obstruction is in abevance and the sufferer is no longer poisoned by absorption. The duodenum recovers itself and an ulcer, if present, heals. The patient resumes the ordinary habits of bie, but has no recurrence of the duodenal pain and improves in health. But the symptoms of autointoxication still exist, and increase steadily as the termination of the ileum becomes more and more obstructed. It is quite possible at the time of the operation that the mechanical factor controlling the end of the ileum, whether appendix or acquired ligament, can be dealt with effectually and further operative treatment obviated. When the obstruction results solely from the mechanical control of the appendix, its removal frees the effluent of the ileum and the result is most satisfactory and lasting. If, however, an ileal kink has developed, consequent on the crystallization of lines of resistance in the mesentery, the treatment is not so simple.

When I first observed the kink as produced by the acquired ligament, I devised many means for its division and for covering over the raw surface thus exposed, and I employed various methods of fixing the ileum in order to avoid recurrence of the kink. I soon, however, had several very unpleasant surprises in the more severe cases I found that the freeing of the intestine occasionally resulted in an acute obstruction, the freed portion of ileum refusing to transmit its contents I also found that even when the membrane had been divided and the patient had recovered from the operation, the toxic symptoms returned when active life was resumed This, of course, did not occur in every case, but in the more advanced cases it did so much too often to be pleasant. Therefore, after a much extended experience and especially when bismuth and X rays showed that there was associated with the ileal obstruction a marked degree of stasis in the large bowel, I have been in the habit of leaving the ileal kink alone and anastomosing the divided end

of the ileum with the pelvic colon immediately below the last kink, and exaggerating the pelvic kink if I did not consider it sufficiently effective.

Again, when I find the large bowel very static, and especially if the abdomen is lar, I remove the colon without the slightest hesitation, since I feel that the risk of its removal in these circumstances is very small indeed, while the benefit the patient obtains from its removal is very great.

If I feel its removal entails any grave risk to the patient, I am satisfied to short-circuit and to postpone the removal of the colon until the patient, freed in great part from autointorication, complains greatly of the flatulent distention of the large bowel

It is of course obvious that the nature of the operative interference in any case must vary with the precise alteration in the mechanics of the drainage scheme and with the condition of the natient

BIBLIOGRAPHY OF CHYLOUS CYSTS OF THE MESENTERY

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THE following are from notes made for a paper on chylous cysts presented to the American Gastro-Enterologie Association at its St. Louis meeting in June, 1910 This paper was prompted by a study of the medical and pathologic features of the case of Dr C E Congdon and by a doubtful case seen with Dr. A. W. Hengerer, which did not come to section In the July, 1912, issue of Surgery, Gynfcology and OBSTETRICS, Dr. Emanuel Friend of Chicago reports an interesting case and tabulates 52 cases from the literature. To a large degree our series coincide, we employed the same method of tabulation, and to save space it is my intention simply to supplement Friend's

The following cases of Friend's list are not included in mine:

Case No 22. Ouinson.

Cases Nos. 29 and 30 Eve These, from the notes I obtained, seemed to be not strictly chylous cysts

Case No 32. Benecke, unless this is one of my unidentified cases mentioned generally by L. Napoleon Boston in his article on chylous ascites in the J. Am. M. Asr., 1905, but the two do not correspond in many details, notably recovery or death

Case No 36. Anifrejew. Case No. 37 Ritter.

Case No. 38 Smoler. Case No. 40 Panas.

Case No. 41. Peau, unless this refers to one of Pean's cases

Case No. 42 St Thomas Hospital Reports. Case No. 45 Evans.

Cases Nos 46 and 47. Brinsmade. These I excluded as probably mere degenerations of hymph glands. Case No. 49. Beefraze.

Case No. 50. Burrows. Case No. 51. Shattock.

Case No. 52. Key and Wilkinson.

Case No. 53. Friend's own case, the last five being published too late for my report

The following discrepancies are worth noting. No. 12 of Friend's list, No. 33 of mine (my numbers not being in chronologie order) is attributed to Schlein by Friend, to Lohlein by me; the age is stated as 27 and 57 respectively; I have the size as that of a man's head and the operation as marsupialization. No. 19 of Friend's list, No 38 of mine, is given by Friend as a multilocular cyst, all compartments containing chyle. According to my notes, there were three compartments, each of about a liter; one was scrous, two were chylous. No. 22 of Friend's list. No 40 of mine, is ascribed to Wenning. This is a misprint, the name being Weining was a unique case, evidently of acute nature. about fifty very thin walled cysts being found, of various sizes, from that of a fortal head to an orange, rupturing on the merest touch At necropsy, the thoracic duct could not be found. In No. 23 of Friend's list, No 45 of mine, the name should be Hoover, not Hover In No. 26 of Friend's list, No 16 of mine, the name should be Syms, instead of Lynes No. 20 of Friend's list, No 8 of mine, the name should be Enzmann, not Epymann There are other minor discrepancies scarcely worth noting.

The following cases are reported in addition. The earlier ones are of especial interest, as they antedate the first formal description by Rokitansky in 1842, who is, as DY Friend states, usually regarded as the first to the early reporters it should be said that their descriptions clearly indicate that they understood the nature of their cases. Indeed, the literature of the 17th and 18th centuries is incher in allusions to lesions of the Jymphatics than modern writings, and the profession generally seems to have had more erudition the subject than we have, although they "knew some things that were not so"

It will be noted that my list of 79, and Triend's of 53, total 96 cases, though, as stated, the two cases each of Eve and Brinsmade, I had excluded as probably not genuine chrlous evsts but rather local degenerative ehanges in lymph glands. However, it is quite likely that other cases, especially of small size, are of like nature. From various cumulative reports, and vague references to literature inaccessible to me, it appears that there are quite a number of other cases recurded It is probable, also, that anyone who has gone into ancient medical literature more thoroughly than myself, will recognize several others Lack of detail, in several instances, is due to my inability to consult the onginal references and it is possible, on this account, that certain cases may have been duplicated or assigned to secondary reporters. The identity of the mysterious W (4th on my list, which follows Carsons' numbering for the twenty eases that he gathered, and 7th on I'mend's list) ought to be known to the Ger-

With the exception of the early cases, preceding Rokitansky's, most of the reporters or their students are still living and, with this mentably incomplete and inaccurate bibliography as a basis, it ought to be possible, by co-operation of national Institutions of research to secure a very full list of cases, with most of the important details. A bureau of record for rare cases certainly should be established, not merely for the sake of numeric completeness but because such a bureau could very early determine the proper form in which to list the salient features of any given condition under study. It is likely that about zoo cases could be accumulated in the

world's literature.

It is not my present intention to discuss these cases in detail but I wish to emphasize the surprisingly favorable prognosis, especially when one considers that the recoveries have been the result of necessarily inexperienced workers, dealing with cases which had been properly diagnosed in only two or three instances. It is worth while also to correct a false impression. Senator has been repeatedly quoted as stating that true chylous effusions invariably contain sugar. What he really said was that, excluding diabetic cases, sugar was rather characteristic of true chylous

608

REPORTED CASES OF CHYLOUS CYSTS OF THE MESENTERY

Benedict's bumber	Supplementary to brand a No.	Reporter	Where reported	Srs and Age	Operation.	Size	Result.	Remarks,
. 0	54	Rokitansky	Lehib d path Aret	21 23	Netropay	\vdash	Death	
12	55	Eppenger	Priger Veljache I		Necropay		Death	Reported at dermoid. Worth revised
21	50	Poncy Jr July 2 2000	Busey	l lours	Necropsy 1	Large	Death	Chilous ascites tapped several times. Bug of maky liquid at beginning of personant
71	57	Le Mery 1710	Acad Sci Paris 1754	F 43	Autobrit	Lery Lerge	Death	Non. Large pendant ambilical berns for years. Calcarrous and soapy de- posits besides chyle, 5 loculi
23	15	Morand 1729	Fled.	M } tyresing	/acmpay	1% Da	Death	
31 	20	Truman Abell (515-33	Boston 3 & \$ J 1933 vol va	1 49	Drunace after apentaneous nepture	as the	Recovery	Also thy lous ascites.
15	to	Hughes 1341	Gray a Moup. Rep. 1841 D 107	M 30	/scuda).		Death	Multiple cysts and thylous sacrees.
10	61	Ducasset 1846	Bull d Soc Anal d Parts, 1518	Not States	Not stated		,	Matthorniae some containing yellow se-
15	61	Milani sod Taliana	Hull d Acad d 3164 Aug 17 1350	и 31	Resection	Sum cc	Recovery	
16	0,5	Pean	Clinaques Chir, safe 83 v satā	1 39	Resection after experience	∷l≪en	Recovery	Called systematicsons and controls pus, but no series multiple
30	04	Naterion	Mark, M. Sac 1154	M. 55	Tipping after rupture by band work	s que	Recovery	No ures, large amount of fat and albu-
Jt	65	Ileha	Ret M J June 15	1 6	Resetting	dt llw,	RK0007	
,,	50	Ruteska	Zentraji,	1 29	Enocleation	Fast	Recovery	
35	67	Kosirupues	Dall & 1 Se Anse d Lare, 1501	toted	Not stated			
30	0.5	Frenteri	Hall Med 1502	Not stated	3farsupsaluation		kecovery	
30	ėg	5 Smith	Quoted by Heining		Excuso4		Recovery	Death later from dosensusted tubertu- ions, which taused blockers of lymph channels.
**	70	Fank	Wen Kin	F 31	Esturpetum ²	Adult brad	Recovery	Cholesterna, lat globules and a few ku cocytes.
**	n	Oler	Lect on Dug of Abd Inform 1844 p. 113	35 40	Accropsy (inter- trud straticula (200)	Man a bead	Death	Observed 5 years. Tapped repeatedly than 5 to 5 % gain, each time at first dark and bloody then creamy. Obstromly statemarky chylons ascites but abdomed dry at necropay.
**	"	Ciordano	Clin Chir Milanu 1895	Not stated	An details			
45	73	Pagenstecher	Beil Lim Wehnschr.	Мл	Marropealization (opened aiter 6 days)		Recovery	O los of faces but no communication with bowel
45	74	Martin	l'erhandt d'Gesellich I Ceburtals u Gynak 1896 11v 11	Not stated	\o details			
40	75	Rosenbeira	terbandt d ter f in nere Med, Berbm, 1897	(chd3	Accropsy, vol-	Each size of fist	Death	

4 Windowsters and three other cases of cyst complicating Chylous sentes are mentioned by E. N. Boston (loc cit.) These three could no be kiertified, and Boston had not preserved his notes.

4 Months of the Chylonia Burst.

BENEDICT: CHYLOUS CYSTS OF THE MESENTERY

REPORTED CASES OF CHYLOUS CYSTS OF THE MESENTERY-Continued

Benedict s	Supplementary to Friend a No	Reportee	Where reported	Sex and Age	Operation.	Size	Result.	Remarks
54	76	Sarweg	Zentralbl f Gymlk 1893, No 16	Fz	Resection pedicle tied and cautenzed	5 hters	Recovery	
55	77	Bruo (Letulie)	Presse med July 20 .	F 7	Excision	375 CC	Not stated	
95	78	Castareg	Toulouse-méd 1901 s	Vot stated	Exterpation		Recovery	
\$7	79	Treiberg	Lastop Roussk Clin 2902	Not stated	No details			
59	80	Scharlemmer	Deutsche med Webn- sche Am M Dec. 18, 1001 p 163	M 53	No details	Child s head	Recovery	No connection with lymphanics glands or panerous could be determined at opera- tion retroperstoneal
60	81	Schmidt	Meth d Gesellsch 1 mnere Med u kindes heil Vienna, 1904	Not stated	No details			
63	81	Demoos	Quated by Pfaff	Not stated	Marcupialization		Recovery	Two loculs, one contained blood the other
64	83	Piet	Lancet Chaid June 14,	F 15	Enucleation	Orange	Recovery	Blood and urine negative
66	841			(child)	Corlectomy		Recovery	
_	834			F s mos	Tapping		Recovery	Several cysts.
68	86+			M s wks.	Aspeation		Recovery	
60	87	Stack	Lancet Clinic, 1907	F 55	Not stated		Recovery	Three loculs, a bloody, all oily crowding intestmes into supra umbrical heroia, 2 calcium carbonate calculs in Cyrt
11	85	R Hmts	Arch f blin Chir,	F 93	Enceleation	Fast Joo cc	Death	Nn apparent cause for death unless mor- phin-scopolamia-chlorologia Origin also-jejunal junction
78	Eg	R Hinte	Thed	M 36	Resection after tapping	600 ec.	Recovery	
72	90	C F P Her-	Verbel report, June	F 66	Evacuation (cyals appored)4	Rice pea liatel nut, double fist	Recovery	Two or three hundred cysts, with 3% gals chylous ascines
23	97	von Hergmann	Langenbeck's Arch	Not stated	No details			
14	97	Retthel	Munchen med Wichn schr, 1907, p 808	M 6	Resection of large cyst	Pen walnut man s head	Recovery	Very many cysts
75	93	E C. Stabb	Quoted by Eve Med Chie Trans, 1898 izzzi	М 6	Resection	diam.	Recovery	Unique location, on outer surface of small mtestine, opposite mesentene attach meni
76	94	Zdarek	Zeitschr f Heile 1900	Not stated	No details			
77	95	Manter and Eltee	Bruo's Beste z klas Char	3Ī 13	Marsupsalization	Soo ce	Recovery	Retropentoneal
79	96	Paul Kiesom	Arch. f path Amat u Physical	M 235	Resection of cyst and compressed draw after tap- ping	Child a bead	Recovery	Multiloculae

³ First no of Benedict's revier taken from Carsons, whose case is No 15 of Friend a list 1 For exclusion and dilatation of lymph channels operation one foot above ileo-excal valve

610

effusions. It is obvious that sugar need not necessarily be present.

The following statistics of the whole series of 96 cases may be of interest.

Sex incidence: Males, 39, females 37, not stated 20, hence no sex predilection.

Age incidence at necropsy or operation: Under 1 year, 5; 1 to 5 years, 6; 6 to 10 years, 0; 11 to 15 years, 4; 15 to 20 years, 7; 21 to 30 years, 15; 31 to 40 years, 12; 41 to 50 years, 6; 51 to 60 years, 8; 61 to 70 years, 3; 71 to 80 years, 3, not stated, 18, but, of these last, 2 were children, one a young adult and one was "young." With due allowance for accidental variations among rare cases, long duration of many cases and distribution of population as to age, it can not be stated that any age is especially predisposed.

Prognosis. Sixty cases recovered, 14 died after operation, 12 were diagnosed at necronsy, sometimes after many years duration, sometimes after death due to other cause; in to cases the result was not stated. Hence the prognosis is surprisingly good.

Nature of operation. Aspiration, mainly in early cases, 5; drainage, mainly after preliminary incision, occasionally after spontaneous rupture, 24; some form of enucleation or resection, 31; marsupialization, 4. In a few cases the cyst seems to have been ignored and. in cases of multiple cysts, the small ones were merely ruptured or ignored. In several cases, the nature of the operation is vaguely stated. It does not appear that the result depended upon the choice of operation but upon essential features of the case or the superior advantages of modern surgery, especially with regard to asepsis, although some of the early cases recovered in spite of the absence of such precautions. While all the marsupialized cases recovered, the deaths after extirpation or enucleation seem to have been due to primitive methods, intestinal occlusion, peritonitis, et cetera, and not to choice of method, and, indeed some of those not stated to have been marsupialized may have been two-step operations

THE VALUE OF COMPLETE PHYSIOLOGICAL REST OF THE LARGE BOWEL IN THE TREATMENT OF CERTAIN ULCERATIVE

AND OBSTRUCTIVE LESIONS OF THIS ORGAN¹ WITH DESCRIPTION OF OPERATIVE TECHNIQUE AND REPORT OF CASES

BY IOHN YOUNG BROWN, M. D., St Locis

HE value of rest in the treatment of inflamed and infected abdominal viscera has long been recognized. The opium treatment of peritonitis as advocated by Alonzo Clark, which has long since been abandoned, and the more recent so called starvation treatment of Ochsner, have for their purpose the arrest of intestinal peristalsis, thereby bringing about bowel tranquilization. Complete physiological rest of certain portions of the large bowel, usually the rectum and lower sigmoid, as accomplished by means of left side colostomy, is of wellknown worth, both as a life-saving procedure

in acute and late obstructions and as a protective measure in cases where subsequent radical work is contemplated.

The various short-circuiting and exclusion operations upon the gastro-intestinal tract are of undoubted value in selected cases It is my purpose to point out in this paper the advantages of complete physiological rest of the entire large bowel in the treatment of certain diseases of this organ, which have heretofore been treated by some of the surgical methods above mentioned, and to describe a technique by which this rest can be accomplished, and when its purpose has been fulfilled, the bowel can be put back into commission in a manner both safe and satisfac-

One of the principles on which modern intestinal surgery is based, and which has been responsible for its wonderful progress and marvelous accomplishments, is the principle of rest. Take, for instance, some cases of stricture of the croopbagus. Who has not seen some of these relax following the rest afforded by a gastrostomy? In gastric and dwodenal uter an abundant clinical evidence has demonstrated the value of the partial sets given to the pylorus and dwodenum by gastroenterostomy. The type of cases in which we have found this surgical rest treatment of value may be enumerated as follows:

- 1. Mucous colitis associated with ob-
- Ulcerative colitis (amœbic, bacillary, tuberculous, etc)
 Obstructions to the colon, both acute

and chronic, due to neoplasms

MUCOUS COLITIS

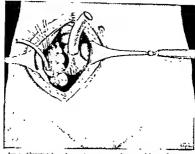
It has been our experience that in the majority of the cases of mucous colitis both the symptoms and X-ray findings show marked evidence of interference with the normal fæcal flow, with the accompanying toxemia invariably associated with chronic intestinal stasis At operation the excum is generally found in the pelvis, dilated and surrounded by well defined membrane Angulations are found at the hepatic and splenic flexures, with the transverse colon sagging almost to the pelvic brim, even with the patient in the Trendelenburg posture Many of these cases receive marked temporary benefit from the Weir Mitchell and other medical treatment, associated with posture and properly adjusted orthopedic appliances It is in this type of case that Lane has adovcated the removal of the entire large bowel down to the sigmoid Finding this operation too radical, he later has practiced the short-circuiting exclusion operation.

Coffey, a fellow of this association, has recently published an able and beautifully illustrated paper in which he describes an elaborate fivation and hammock-swinging procedure for the correction of the deformities of these unfortunates While I have obtained some brilliant results from the operation of Lane, I have had however, a number of cases in which most distressing post-operative symptoms have developed, for the relief of which secondary operations became necessary. I have never undertaken the suspension operation of Coffey, as my experience with similar fixation operations in the past has been far

from satisfactory
The technique which I will shortly describe
seems, from my comparatively limited expeence to meet indications better in the cases
under discussion than either of the methods
above mentioned By it all pericolic bands
and adhesions can be severed, the caccum
elevated from the pelvis, and the intestinal
stass immediately relieved The entire
colon can be put at rest and during this process of complete physiological rest the patient
can be given the benefits which follow dietetic,
hygienic and orthopedic treatment, thus
giving the bowel a chance to regain its normal
tone.

ULCERATIVE COLITIS (AMEBIC, BACILLARY,

TUBERCULOUS, ETC) While many of the ulcerative types of colitis respond to medical treatment and colonic lavage, the severer types are now recognized as surgical In the operative treatment of such cases three procedures have been resorted to First, appendicostomy. second, excostomy, third, ileosigmoidostomy All of these operations are objectionable. The first two simply permit of colonic irrigation and medication As fast as the colon is flushed with solutions it refills with the facal contents from the small bowel, thus the area under treatment is constantly contaminated. A very serious objection to the short-circuiting operation is that the lower pelvic colon is almost invariably involved in the colitis. and it is impossible in the majority of cases to bring a loop of ileum to a part of the sigmord distal to the disease; hence, when this is done, some degree of the symptoms, namely, that due to the sigmoid below anastomosis, will persist.



tig a Moning tule and pure string in proximal portion of fleum. Stump where appendix was removed and stump of inverted distal fleum. Mo catheter and purestring in agrowed showing faction subure.

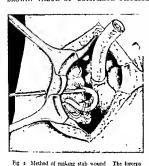
OBSTRUCTIONS TO THE COLON (BOTH ACUTE AND LIBONIC) BUT TO MEDITAMS

The advantage of the operation suggested by the writer will readily be seen when it is applied to the treatment of acute and chronic obstructions of the sigmoid and rectum possesses all the advantages of the left side procedure with none of the disadvantages. It permuts a drainage of the distended small intestine as well as test and irrigation of the large intestine. In those cases of low havel obstruction in which the diagnosis is in iloubt, it should be the operation of choice A left-side artificial ands is easily made but we all appreciate the difficulty of closing it If the obstruction is thue to an inoncrable malignancy the left side anus possesses no advantages over the right-side method. If the iliagnosis is wrong and the growth is a benign one, it will readily be seen that the left-side operation should not be undertaken. for the reason that its closure is both difficult and dangerous and will greatly interfere with the subsequent surgical treatment, namely, the closure of the artificial anus Another advantage of the right-side anus is the relief afforded the patient when constantly inhaling the horrible stench that is the invariable accompaniment of the left-side operation. The contents of the small bowel possessonly a slight odor and, contrary to former teachings, there is no irritation of the skin. On the contrary, when the operation is done on the left side, the stagnating and filthy faceal flow from the colon brings about a condition almost unbrarakty.

OFFRATIVE TICINIOUT

Through a right rectus incision sufficiently long lor general exploratory purposes the abdomen is opened The crecum is at once sought and the large bowel is carefully examined from excum to sigmoid Att pericolic adhesions are then severed the appeathe removed and the stump buried. The tleum is next severed between two clamps close to the the careat valve. The distal theum is tied off and bursed as was the appendix As a suitable part of the cacum a purse string suture of linen is placed. and the excum is next incised. Through this incision a large rubber catheter is inserted after which the purse string is tightly tied. A second purse-string of No. 1 chromic catgut is next placed. Under the loops of this purse-string, three long calgut fixation sutures are placed (lig t) \ stab wound is next made at McBurney's point, through which a forceps is inserted. The catheter and fixation sucores are grasped in the bite of this forceps and pulled through the stab-wound. The peritoneal





shown grasping the catheter and fixation sutures

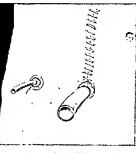


Fig 3 Showing catheter and button in place wit fixation sutures tied Artificial anus with tube in proximal portion of ileum Wound closed

surfaces surrounding the catheter are next scarified and the eatheter is pulled through the stab-wound, earrying with it the three fivation sutures. The catheter is now slipped through the button, and the fixation sutures are threaded through the eyes in the button and tightly tied, thus closely approximating the serous surfaces of the cacum to the parietal peritoneum (Fig 2) A stiff rubber drainage tube is next inserted into the proximal ileum and fixed with a double purse string suture The tleum is now brought out of the lower angle of the rectus The parietal peritoneum is made to bug it snugly by a few catgut sutures, and the abdominal wound is closed in the usual way (Fig 3) Indications for restoring the continuity of the large bowel are improvement of the general condition and the return to normal of the discharge from the excluded large bowel as shown after repeated chemical microscopical or culture-growth examination of irrigation fluids passed through rt depending upon the lesion present. This restoration should not be made too early, particularly in the ulcerative lesions of the colon When the surgeon deems that the large bowel has sufficiently healed and desires to put this organ back into commission this restoration is readily done by simply cutting out the anus at the lower angle of the rectus incision closing its end with a purse-string suture, and making a lateral anastomosis of ileum to ascending colon, or switching the ileum into the sigmoid. We have never

found any difficulty in restoring intestinal continuity, on the contrary the operation is simple and easy

REPORT OF CASES

This report is based upon the experience we have gained from ten cases so operated Two were cases of chronic intestinal stasis. with obstructions due to pericolic bands and flexures Both have greatly improved and are now comparatively well. Three operations were done for the relief of amœbic dysentery All were cured One for ulcerative colitis with extensive involvement of sigmord and rectum This patient is now in good health One case for extensive obstructive tubercular colitis This patient received great relief from the operation and lived in comfort for two months. Three were for late and inoperable malignancies of the rectum. One lived six months, one five months, and the third case, still living, nine months after operation, is comfortable, and is in reasonably good health; so it will be seen that there was no mortality in the series.

THE FIRST SUCCESSFUL CASE OF RESECTION OF THE THORACIC PORTION OF THE ŒSOPHAGUS FOR CARCINOMA¹

BY FRANZ TOREK, A M, M D, NEW YORK CITY
Surgeon to the German Hoopstal and the New York Sun and Canter Houghtal Adjunct Frofestor of Surgery in the New York
For Gendante Medical School

HE resection of the thoracic portion of the resonhagus for carcinoma has been one of the greatest problems of modern surgery It is not the object of this paper to give the history of resophageal surgery, much less could I mention the notable achievements of any one surgeon without injustice to others not named. But I must call attention to the view expressed by one of the most competent representatives of this branch of surgery, not only because it exerted a far-reaching influence on the efforts of others, but especially because my case does not substantiate this view. I refer to the standpoint of Sauerbruch that operations for carcinoma of the osophagus should be undertaken only if the new growth is either high up near the neck or low down, where an anastomosis with the stomach could be made. but that the growths in the middle portion of the œsophagus are not removable The reasons for excluding these cases from the realm of operative interference were, first, the inaccessibility of that portion of the œsophagus which passes behind the arch of the aorta, and secondly the danger arising from injury to the pneumogastric nerves, which in that location branch in front of the esophagus like a plexus Division of both vaga at a place before they reach the heart causes instant death, and at operations in that region it has been repeatedly observed that tugging at a vagus, or pinching it, was promptly followed by collapse of the heart, as manifested by the pulse, which persisted for a longer or shorter time, until death set in Finally, the uncertainty of the closure of the upper stump of the esophagus, and consequent infection of the pleural cavity, has been a source of great danger after resection in any part of the esophagus where an anas tomosis could not be made. The leakage

from that stump was doubtless due to the tension in the casophagus from swallowed saliva. Every contraction of the constrictors of the pharynx would temporarily increase the tension in this blind pouch, until the suture finally was unable to withstand the pressure from within. The patients who had escaped death either from injury to the vagus or from shock, pneumothorax, or pneumonia, all died from the giving way of the csophageal closure, no matter how skillful the constraint stream had been

operating surgeon had been. Statistics show that carcinoma of the coophagus is most frequently found in the middle third, the location in the lower third coming next, while those in the upper third are comparatively rare On the other hand, metastases are found most frequently with those situated in the lower third, near the cardia Since, therefore, the carcinomata at the cardia are not only numerically less frequent than those in the middle third, but are also more frequently associated with metastases that render the cases incurable, the most important rôle in the problem of cancer of the orsophagus seems to belong to the carcinomata in the middle portion, the very ones that Sauerbruch and others advised leaving untouched

In a case operated at the German Hospital on Marrh 14, 1973, I succeeded in demonstraing the feasibility of resection of it fine flashing the feasibility of resection of the flashing and the flashing and the flashing and the flashing as woman for years old, had a carramona of the crophage beginning just below the lower border of the transverse portion of the arch of the aoria and extending from there downward for about 13/4 inches. A pair of very beautiful sterescopic X ray pictures taken by Dr. William H. Stenart demonstrated the conditions before the operation. A reproduction of conditions before the operation. A reproduction of these is seen in Fig. 1 more provides to the resection of the excepting as Knowing the difficult of the condition o

¹ Read before the New York County Mechael Society Manch 24 years the Harlem Medical Assertation. April 2 2013, the Surgical Section of the New York Academy of Medicane April 4 2013 and the German Medical Society of New York April 7 2013.





and means of overcoming them. It was necessire, first, to afford better access secondly to perform more careful disacction of the vags avoiding rough handling of them, and thirdly, to do away with the danger of leakage from the proximal stump after resection.

The method of access to the field of operation was as lollows. Instead of going through two different interestal spaces and dissecting off the sexpuls or of resecting several alignent risk as recommended by others the incision was carried through the whole length of the seventh intercostal space from the posterior end of which it was extended upward by cutting through the seventh swith, fifth and fourth nhs near their tubercles which gave a much better crossure and is far simpler. The photograph (Fig. 2) shows the sear from the incision, the upper and of which is almost at the keyl of the shoulder the front end of the incision is seen in Fig. 3. This labels, the accommanying at its a marking with an

trate of silver made on the day before the operation Extensive adhesions between the lung and the parietal plears were present, the greater part of the operation of the properties of the department of the department of the cost and the department of plears. The firmest addissions were at the apex. All these were separated. The tumor was found to be fairly fived in the position above



In 2. Photograph taken 12 days after the operation The black line accompanying the invision is a intrate of silver marking made the day before the operation. The upper end of the incision is almost at the level of the shoulder. The anterior end of the incision is seen in Fig. 3.

described viz just below the lower border of the transverse portion of the arch of the aorta, allowing only very slight mobility The portion of the cesophagus below the tumor between it and the dianhragm was exposed in the usual manner by in cising the pleura, drawing the vagi aside and lift ing the ersophagus out of its bed At the site of the tumor the desection of the vage was more difficult, and some of the branches crossing over in front of it had to be cut in order to permit liberating the tumor without undue roughness in handling the vaga To my great satisfaction the pulse never wavered during this procedure, remaining between 03 and 96 The dreaded vagus collapse had, therefore been safely avoided

The dissection of that part of the excophagues which passes behand the arch of the aorts offered great difficulties, which were finally overcome by debodging the norts at that site and lifting it forces that the state of the s



Fig. 9. Pobograph taken iz days after operation. The mission at the antenor border of the left sterno-cleidomastoid muscle, through which the crophagus was taken out is searcely recognisable. The crophagus has been placed under the skin of the cheat and its end sutured to an incision in the skin. The gastrostomy tube is introduced into the exophagus was henever the patient desires to swallow.

done without ligating the thoracie branches of the aorta. The tumor was attached to the left bronchus, which sustained a longitudinal cut during the progress of the separation of the tumor from it. The cut in the bronchus was afterward sutured with silk.

The exophagus had now been detached from its bed, beginning at a point about an inch above the diaphragm, up to about an wich above the architecture of the arctic The resection of the carcinoma in sufficient Parks the condition of the condition

left sterno cleido-mastoid muscle. Thus the pleural carvity could not possibly become infected from that source. The ligation of the lower stump had been made after first crushing the osophagus at that site. This stump was invaginated like an appendix stump, only with the difference that two successive purse-string sutures of sik were used

instead of only one, as in the case of the appendix The thorax was now closed, silk threads being used to hold the seventh and eighth ribs together, chromicized catgut for the muscles, and silkworm gut for the skin No drainage was employed. Now the cesophagus which was hanging out from the wound in the neck was placed under the skin of the chest For this purpose a transverse incision was made in the skin at a place corresponding to what was going to be the free end of the asophagus after the carcinoma was cut off, for at the time this was still attached. The site of that incision in this case corresponds to the second intercostal space. The skin between the incision in the neck and the new incision was tunneled, the asophagus drawn through, the carcinoma cut off, and the fresh rim of the assophagus sutured to the skin. The neck wound was closed

wound was closed
As regards other details of the operation, I may
say that the incisson through the skin and muscle
was made under local angisthesis, one bill per cent
no-ocain with suprarentil being used. The general
anexibests was pren by tracked musifiation according to Melizer-hure, the apparatus constructed
by Dr. Hermann Escher being used. It will
be the state of the state of the state of the state
of the state of the state of the state of the
central pressure chamber either positive or negrature, could not be considered, as the rubber ruli
around the patient's neck used in such an apparatus
to separate the art about the bead from the arration
to separate the arrabout the bead from the arration
the body would have interiered with the operation
at the neck.

at the neck

From the notes taken by Dr. Carl Eggers, who
administered the auxisthetic, I extract the following For the induction of auxisthesia, r5 cc of



Fig 4 On the left side a portion of the specimen has been removed for pathological examination

anasthol was used. Then intubation was performed, a woven silk catheter, No 18 French, being introduced with the aid of the finger The eatheter was fastened to the upper lip by a suture, as the patient had no teeth to which to tie it Ether was used now for anæsthesia, 100 ec sufficing for the entire operation. The pulse was regular and of good quality throughout the operation except when the aorta was strongly pulled over for the purpose of suturing the cut bronchus. At that time it became weak and rose to 102. Strychuin, caffein, and camphor were used for stimulation. A hot coffee enema with whisky and strychnin was also given at the end of the operation. The intrathoracic portion of the operation, from the incision of the pleura to the closure of the thoracic cavity took I hour and 45 minutes, the whole operation, from the first incision to complete closure, 2 hours and 43 minutes, the general anasthesia, 2 hours and 27 minutes

The microscopic examination of the specimen made by Dr Frederick B Humphreys proved the nes growth to be a squamous celled epithelioma From his description I quote the following In the center of the speciman (Lig 4) there is a ragged indurated ulcer, roughly circular in form, measur ing 46 cm. across and 43 cm from above down The ulcer extends over the entire circumference of the mucosa, excepting a small strip about o 8 cm in width The floor of this ulcer is ragged, reddened, and firm, the edges raised and nodular and fairly well circumseribed. The adjacent portions of the enophageal mueosa show a few small, non-ulcer ated, raised nodules, but at the lines of section the mucosa appears entirely free from invasion. The outer surface is rough. The external coat is slightly lacerated, but nowhere has the tumor macroscopically grown through, excepting in one region where there is a nodule about 1 cm. in diameter Im mediately over this nodule is a soft anthracotic lymph node attached to the muscle

My assistants at the operation were Drs. Frederick H. betterch, Martin Bry, and Albert Barge members of the house staff of the German Hospital. The patient made a good recovery. The stuckes were removed, some on the fourth day and the remaining ones on the seventh day, when the wound proved

to be completely closed. The pulse, respiration, and temperature had become normal by the fifth day. The highest point that the temperature had reached was roz^o F, on the third day after the op-

Up to the eighth day after the operation the patient was nourished in the same manner as before the operation, through the gastrostomy tube with a funnel attached After that time the free end of a eastrostomy tube was introduced into the cut end of the ecsophagus for the purpose of feeding the patient (Fig 3) The rubber tube being of somewhat smaller caliber than the ecsophagus, the patient has to make slight pressure upon the skin to one side of the tube to prevent leakage. This is accomplished by the patient without the slightest trouble, and she now swallows all varieties of food that can be chewed into an almost fluid state, such as bread cereals, potatoes, eggs, spinach, etc. As she had not been able to take any bread for about nine months before her operation, she feels very happy with her rubber esophagus

A number of methods of cosophagoplasty have been devised, the most promising of which at the present time seems to be that of Juanu, utilizing the greater curvature of the stomach to form an esophagus. This is placed under the skin of the thorax and in lavorable cases may reach up to the end of the divided cosophagus so as to render a union of the two ends possible

Now that the way for a successful performance of this operation has been shown, it is our evident duty to advise operation as soon as the presence of a carcinoma of the resophagus to recognized, remembering that success depends to a great degree upon early diagnosts and early operation, and that it is not wise to wait until the difficulty in swallowing becomes marked before our suspicion of the presence of cancer is aroused.

PROSTATECTOMY; WITH SPECIAL REFERENCE TO THE SEQUELS 1 By JAMES E MOORE, M D. MINLEADURS, MINNESOTA

THEN we first began to perform prostatectomies we usually did the suprapubic operation, and only removed the projecting portion of the prostate. The operation was blind, bloody, and unsatisfactory, and the mortality rate was high The immediate results were sometimes satisfactory, but a return of the obstruction was not uncommon. Under these conditions the operation was not a popular one The present popularity of prostatectomy began with the development of the perineal operation, which was a complete operation, was followed by better and permanent results, and was accompanied by a lower mortality rate. For a time this operation was very popular, and the journals were filled with reports of successful results. Had the unsuccessful results been as faithfully reported, the operation never would have become so popular At the present time perineal prostatectomy, in capable hands and in properly selected cases, is a life-saving and conservative operation, and is the first choice of many of our best surgeons

After the advantages of a complete enucle ation of the gland had been demonstrated by the perineal operation, it was found that the



Fig. 1 WHITEH, Dute there is one
1 Read before the Southern Surgical and Generalogical Security December 19 1912

gland could be readily enucleated through the suprapubic opening, and it is now the most popular operation. Even after the upper operation had become quite popular its mortality rate was considerably higher than that of the lower operation At the present time the mortality rate of the two operations is practically the same, and is naturally lower than it was during the period of development. I was an early and enthusiastic advocate of the lower operation, but as time has gone by and as the technique of the upper operation has become developed I have found myself resorting more and more frequently to the latter operation, and this has been the general trend of surgeons No surgeon should be medded to one operation, but should be proficient in both, so that he can fit the operation to the patient and not the patient to the operation The popularity of the upper operation is largely due to the fact that it is the easier operation to perform Its enthu siastic advocates claim that there are fewer complications and sequels, and that convalescence is shorter and more satisfactory, but

these are still moot points When the possibilities of complete prostatectomy were realized the operation was soon being overdone by many surgeons - and was undertaken by many would be surgeons The reaction was natural and wholesome, so that now expert operators are more conservative and novices have learned that it is not a good operation to experiment with A few years ago one enthusiast said that the operation was so simple and easy that it should be relegated to minor surgery, but I am sure that all my hearers will agree with me that it is a serious major operation, and that it should not be undertaken lightly by the experienced surgeon, and should never be undertaken by

the occasional operator
It would be a waste of your valuable time
to describe the technique of these operations,
because it has been so often and so well
written, but there is one practical point in the

technique of the upper operation which I have practiced and taught to my students for a number of years, and to which I wish to call your attention. Most writers recommend that after the suprapubic opening is completed and the operator is ready to attack the gland, he begin by cutting or tearing through the mucous membrane of the base of the bladder over the most prominent part of the enlargement. I have found it much easier and quicker to force the point of the index finger into the internal meatus until the mucous lining breaks, when the finger can be readily passed through this break and the gland enucleated In this way the gland can be enucleated nearly as quickly as the cut could be located and made in the mucous membrane, and with much less hæmorrhage I can heartily recommend this little maneuver original with me, but others have also discovered it. Dr L L McArthur, of Chicago, published the first description of it

The general practitioner should be interested in prostatectomy, and should be familiar with its possibilities and its indications and contraindications, for it is usually to him that the patient first goes for relief Conscryatism should be the watchword in these cases, but it is not conservatism to postpone operation until organic changes have taken place in the bladder and kidneys Every general practitioner should fully realize that when he is called to relieve a patient from retention of urine due to an enlarged prostate he is facing a grave responsibility Up to this time the patient may have had little or no suffering, but will only have been inconvenienced by being obliged to get up at night to urinate If the bladder is emptied aseptically at this time, the patient may go on indefinitely without serious trouble, but should the doctor, through carelessness or by use of a dirty catheter, infect this bladder, the patient is immediately in a serious condition, which may end in death in spite of all human agencies

Prostatectomy is too grave an operation to recommend simply because the patient has an enlarged prostate which is causing him some trouble. An enlarged prostate is very easy to diagnosticate, and should not be overlooked

by anyone. The general practitioner, when clean and careful, can with propriety resort to an occasional catheterization, but when its repeated use is called for he should take this as a positive indication for prostatectomy. At the present day a patient should never be introduced into catheter life without first having had the advantages of prostatectomy urged upon him, for the ayerage length of catheter life is not over four years, and if every patient were to have a prostatectomy performed when he begins to have serious trouble, the average length of life would be very much longer than this.

Old age is not of itself a contraindication for the operation, because many successful operations have been performed upon patients well up in the eighties. When a patient has not been properly advised, or has refused to accept good advice and has drifted along until there is extensive infection of his bladder. with possibly infected kidneys, he is not a choice subject for prostatectomy; but without operation he will surely be a great sufferer and will live but a short time, so it would be wrong to deny him the benefits of surgery. In such cases suprapubic drainage can be safely established under local anæsthesia, which will afford wonderful relicf, and quite frequently the patient will improve so much after this that a prostatectomy may become advisable

Prostatectomy even in suitable cases is not always satisfactory, because of sequels which make the patient feel that he is little better off than before the operation; and occasionally he is worse after the operation than he was before Not infrequently a patient who has been operated upon and discharged by the surgeon in a seemingly satisfactory condition comes back to the family doctor suffering from some sequel that makes his life miserable

When a comparatively young man has trouble enough with his prostate to induce him to consider prostatectomy, the effect it will have upon his sexual powers is a very important question. It is quite customary in reporting results from prostatectomy to state that the sexual function is unimpaired. We know that this is a truthful statement in many

cases, but every observing surgeon knows that there are many eases where this function is either greatly impaired or totally destroyed by the operation. When the ejaculatory duets are destroyed, as they usually are, the patient is necessarily sterile, which is a matter of comparatively little importance, for most of these patients are sterile belore operation, but unfortunately many of them are impotent after prostatectomy. It is difficult to get at the truth in this matter, for the patient considers his condition a disgrace rather than a misfortune, and is not disposed to talk about it. Very naturally, however, he will about it. Very naturally, however, he will show the consideration to his friends.

The fact that prostatectomy does not always cause impotence proves that the loss of the gland is not the cause of this unfortunate sequel The destruction of the ejaculatory ducts cannot be the cause, the impotence would be the rule instead of the exception Until we have learned just what it is that causes impotence after this operation it is impossible to prevent it It is rational, however, to conclude that, inasmuch as ercction is due to a reflex stimulus, the damage must be due to an injury to the nerve supply When we take into consideration the fact that at best prostatectomy is a rough and rather unsurgical operation, performed upon parts highly organized and with a most delicate and sensitive nerve supply, the marvel is that impotence does not always follow

Gangrene of the bladder is an occasional sequel. I have had one case of this kind within a year. A suprapubic operation was easily and quickly performed and the patient did very well for four days, when his pulse began to go up, and he soon died. The bowel was not injured, but the whole base of his bladder was gangrenous. The possibility of this sequel should be remembered, and unnecessary bruising and tearing should be avoided. In this way the danger of gangrene will be reduced to the minimum, but the probability is that it will occur occasionally in spite of every precaution.

Every surgeon learns to search the bladder carefully for stone at the time of the operation, because many cases are on record where

stones were left which necessitated a second operation for their removal. There is no doubt but that stones do sometimes form in the bladder after the operation, for which the operator should not be held responsible. Doubtless, fragments of the prostate or clots of blood act as a nucleus around which a stone may form. That they may form quickly I am convinced from the following experience I performed a suprapuble prostatectomy, removing a very large prostate through a badly infected bladder. Owing to the condition, I thought of the possibility of stone, and explored the bladder most carefully, both with fungers and instruments, and found no stones. The patient had been bedfast for some time before the operation, but made a very rapid convalescence and soon resumed his business, being, as he stated, in perfect In much less than a year, but just how many months after the operation I do not know, he came to my office stating that he was having pain and frequent unnation. I suspected stone, and advised him to go to the ho-pital for examination. This suggestion did not seem to meet with his approval, for I did not see him again. Some time afterward I learned that he came under the care of another surgeon, who removed a large stone from his bladder. This surgeon informs me that the patient came to him suffering from an abscess in the abdominal wall at the seat of the scar, and that the presence of the stone was not known until found when the abscess was opened The stone was a large one, but I am confident that it must have formed after the operation, because I searched so carefully for it at the time of my operation, and because the patient was so thoroughly relieved by the operation.

This skiagraph (Fig. 1) illustrates how stones may be in a pocket so that they escape detection. This patient was operated upon at the University Hospital by one of the staff. The perineal operation was performed and a very large prostate removed. The opening required was so large that it caused the operator some tunesainess, but it afforded ample opportunity to examine the bladder, which was carefully done. The patient, although old and quite feeble, made a prompt

recovery and soon began to void urine naturally. When he was about ready to go bome he reported that he had passed two stones through the urethra. The stones resembled medium size gallstones, and were faceted. Before passing the stones he had been perfectly comfortable, but this can be accounted for from the fact that they were closely packed in a pocket. In the original plate this mass is distinctly shown to consist of many stones closely packed together, but this print does not bring this out clearly

Careful search for stone should be made after every prostatectomy, for they are so often present and they should not be overlooked. A skiagraph should be taken before every operation, which will demonstrate the presence of all stones, whether pocketed or not. Before closing the wound the bladder should be thoroughly emptied of all detritus, and later all blood clots should be removed

In early cases of prostatism, where the bits control of the cystisce in the cystisc not too severe, the cystoscope is very helpful Stones can be detected, the condition of the mucous membrane ascertained, and the ureters catheterized. In older cases, however, the cystoscope is liable to do more harm than good. The greater enlargement makes the introduction more difficult and painful and elevates the beat, of the instrument so that the ureters cannot be seen Even if they could be exposed, their cathetrization through a highly septic bladder is an unwarrantable procedure.

A few years ago utinary fistule were not an uncommon sequel, but with our present an uncommon sequel, but with our present technique this is very rare. A fistula is most likely to occur when the cystilis is so severe that liberal and sometimes protracted drainage is an essential part of the treatment with a reasonably clean bladder the present trend of surgical technique is toward a more thorough closing of the wound, which shortens the convalescence and reduces the danger of situla to the minimum.

In some instances, owing to the atony of the bladder before the operation, the patient is still obliged to use the catheter after the obstruction is entirely relieved. He has been greatly benefited, because a large sized catheter can be passed without pain, but he naturally feels that the operation is not a perfect success. It is impossible to remedy this condition. It is wise to inform a patient who has led a catheter life for some time that possibly he may be obliged to continue the same after an operation, but it is safe to promise him that catheterization will be much easier and comparatively painless afterward.

Incontinence or dribbling is an occasional sequel after both operations, and is of course due to injury of the sphincter muscles or their nerve supply The sphincter at the neck of the bladder is always stretched and more or less injured by the upper operation, and special care should be exercised during this operation not to tear it In the lower operation the sphincter of the bladder is not in so much danger, but the accelerator urinae muscle about the membranous urethra, which has an important sphincter action, is very liable to injury To avoid this, entrance into the urethra should be made at the apex of the prostate, through the prostatic urethra. Incontinence is the sequel which makes the nationt feel that the operation has done more harm than good. He forgets that he has been relieved from pain and thinks only of his present affliction, which makes him a nuisance to himself and to everyone around him. This is a most distressing sequel, and every precaution should be exercised to prevent it, for it is practically incurable when once established.

In conclusion, the writer wishes to state that he is an optimist and believes that the present day prostatectomy is one of the most beneficial operations at our command; but he feels that the number of failures and sequels are too numerous, and this leads to the question if less radical measures may not be better, such as removing the middle lobe by instrumental means, as suggested by Young, or removing the middle lobe and stretching the prostatic urethra through a suprapubic opening, as practiced by Siter of Philadelphia. Siter's suggestion is surely worthy of consideration, because his large experience has led him to conclude that dilatation is accompanied by practically no complications and sequels, and is followed by most satisfactory results.

NITROUS OXIDE AND OXYGEN ANÆSTHESIA¹

OBSERVATIONS IN 2500 CASES

BY E. M. PRINCE, M. D., BIRMINGHAM, ALABAMA

HE question of the selection of an anæathetic continues to be of first importance to the surgeon of to-day who endeavors to give to those seeking his skill the best of everything connected with the art of surgery. All realize that the question of the best anæathetic in all cases is far from answered. It is only by the comparison of series of cases under one kind of anæathetic, and only when many thousands have been given, that one can draw any conclusions Many thousands may be anæathetized by one anæathetized by one anæathetic agent before we are able to find out its real dangers or advantages.

The post-operative effect on the patient, together with his condition when the anasthetic was begun, should be taken into consideration. We might have a very high death rate on the table in cases whose condition was exceedingly grave when the anæsthetic was begun, while on the other hand a more dangerous anæsthetic agent might show a decidedly lower mortality if given in cases whose resistance was about normal would be very unfair to condemn the anxsthetic, and hold it wholly responsible for the death, unless all conditions were taken into consideration. On the other hand, when a death occurs while the patient is on the operating table, whether the operation is under way or not, unless very conclusive evidence to the contrary can be produced, the anæsthetic should come in for its share of responsibility

If we are overenthusiastic as to the virtues of one anæsthetic agent, we can ofttimes find some cause other than the anæsthetic for the accident, such as status lymphaticus, etc.

While I would not like to say that the anæsthetic under discussion (nitrous oxide and oxygen) will ever be the anæsthetic of choice for the majority of surgeons—for there are quite a few disadvantages that require time and patience to overcome—

still I believe its administration in 1000 cases in which the resistance had been greatly reduced by disease will show a mortality rate so favorable to this anaesthetic that one would hesitate to use any other

SELECTION OF CASES

The very old, the very young, patients who have any cardiac complications, and the very large, robust subjects, are said to be unfit for nitrous oxide and oxygen anasthesia. The very old are the cases in which this anasthetic is used to the greatest advantage. Their tendency to lung complications, the usual nephritis in these old people, and the desire to make their post-operative condition as comfortable as possible, render this anæsthetic the ideal one in these cases. The objection advanced by some that "the blood pressure is elevated, making the aged more likely to cerebral apoplexy," will not hold good, as this can be prevented by giving enough ovygen We can operate on these patients using 8 per cent oxygen, or in the same cases give 12 to 15 per cent, and the patient will sleep as nicely under the latter as the former proportion They can be gotten out of bed much earlier, as they seldom go through the prolonged stage of nausea and vomiting seen

after ether.

Those cases presenting cardiac complications do not show the rise in blood pressure in there is sufficient oxygen given, and would certainly do as well under the gas-oxygen as under ether. We have talen the blood pressure in many of these cases while they were under the anxesthetic and found it varies very little from what it was before the anxithetic was begun. I have never used nitrous socide and oxygen in children under three years of age, but I find a child of this age and over does extremely well. The very large, robust subject 1s as casy to anxesthetize with nitrous oxide oxygen as the smaller. It does

other

not seem to require any more of the gas than in the smaller subject to produce surgical anæsthesia. A great deal depends on the individual patient.

PREVIOUS HABITS OF THE INDIVIDUAL

The man who has been a constant and hard drinker is a very unfavorable subject for any kind of anæsthetic, although I think he takes the nitrous oride and oxygen equally as well as he takes ether, provided a preliminary of scopolantin and morphin is given him In many of these cases we experience no trouble, while in others we have the same struggling seen in almost all of these drinkers when ether is the anæsthetic asert.

The morphin habitue is also a harder subject to ansethetize with nitrous ovide and ovygen than one who is not addicted to the drug. One with a nervous tendency will take the ansesthetic as easily, but I do not think the pulse will run as smoothly under the ansesthetic as now who is not easily excited

The dark-skinned race is one that requires the most careful watching on the part of the answhetlst, because the cyanosis is not so readily seen in these cases, and in the negro it cannot be seen at all My anasyhetist, Dr. Dawson, informs me he is governed in these cases entirely by the pulse rate and

tnese cases entirely by the pulse rate and respiration.

In these the average per cent of oxygen is also commenced with and the amount then varied according to the requirements of the individual case.

CONDITIONS DEMANDING NITROUS OXIDE-OXYGEN

Case in which this anesthetic is especially indicated are those suffering with lung and kidney complications, those in which we have a very low hammoglobin, and those that are extremely septic. No one who has followed the investigations of such men as Crile, Hamberger, and Ewing, and many others, could think of suggesting any other anesthetic where we have a grave nephritic complication in a case where surgery is a necessity There are absolutely no ill effects ever seen following this anaesthetic in these grave cases. In our normal cases we find more urine excreted

during the first 24 hours after nitrous oxideoxygen than for the same length of time following ether. We never have albumin following the use of this anæsthetic, which is not the case where ether is used. To the tubercular patient, whose lungs are already waging a desperate battle against the invading organism, nitrous oxide-oxygen is certainly a godsend These patients are not hastily operated upon, but ofttimes we are compelled to resort to surgery, where their already desperate condition is complicated by some other infection more dangerous The irritating action of ether on the lung tissue in these cases is perhaps just sufficient to turn the tide in favor of the disease The post operative pneumonia following ether is never seen where nitrous oxide and oxygen are used. In the very septic cases, and those whose hamoglobin has been greatly reduced by continuous bleeding, nitrous oxide and oxygen certainly give the patient the better chance of recovery It has been shown that hæmolysis never follows the use of nitrous oxide and oxygen anæsthesia, nor is the hæmoglobin reduced This cannot be said to be the case after other forms of anæsthesia. These infected patients are fit subjects for shock, but are rendered less liable to it, as it has been proven that a patient is not so susceptible to shock under this angesthetic as under any

PREPARATION OF PATIENT FOR OPERATION

The patients are prepared in the usual manner in most respects, such as cleansing of the boxels, the deprivation of food for 12 hours, and it is best that no water be given to the patients during the hour preceding the operation, as this will render them less likely to recurstation while on the operating table.

PRELIMINARY MEDICATION

The usual preliminary given by me before operation is morphin sulphate gr. ½ to ½, atropin sulphate, gr. 1/100, and strychain sulphate gr. 1/30. Insubjects that have been hard drinkers, estopolamin, gr. 1/200 to 1/100 will prove an aid to the anæsthetic. In many cases this preliminary medication is unnecessary, and I have given over 300 without using

any preliminary whatever. No morphin should ever be used before operating on children, as it is unnecessary, and as a rule children bear an opiate poorly I was recently taken severely to task by one who by reputation as an anæsthetist has no superior, and wbose good opinion I value most highly, for reporting as nitrous oxide and oxygen anasthesias those cases in which we had given a preliminary of morphin gr. 1/8 to 1/4, he stating that none of these were nitrous oxide and oxygen anæsthesias, but should be classed as morphin, nitrous oxide and oxygen anaesthesias. I do not agree with anyone in this stand as the morphin is not an essential part of the anxisthetic, nor is morphin considered an anæsthetie agent. It is used to render the nationt a better subject for its administration. just as we use restriction of food and other measures

One of the most important functions of the preliminary of morphin is its anodyne effect, as the patient awakens so quickly the pain would be quite severe were it not for this preliminary. In children, camphorated uncture of opium may be given just before operation, and may be continued afterward, as vomiting is so seldom seen in children after this anarsthetic.

ADMINISTRATION

No one should be permitted to administer infrous oxide and oxygen unless he be well trained in the work or is giving ut under a suitable instructor. This will never be the routine hospital anaexthetic to be given by the internes. It will always require one who has devoted time and thought to the question of anaexthesia in general, and this form in particular. The surgeon should employ one trained anaexthetist who is permitted to administer every anaexthetic for him, as in this way he will become more efficient in the work.

The trained anesthetist should be paid as every other specialist in medicine, and the surgeon should not desire the services of a specialist at the price of a day laborer. It is special field of surgery were better appreciated and better paid, we would find more competent men seeking to perfect them-

selves in the art of administering an anasthetic. The anasthetist should be a man of pleasing manners and good address, and one selected because of the soundness of his gray matter, not because of the lack of this very essential element. He should be thoroughly familiar with physical diagnosis, and be required to examine every chest before administering an anasthetic. He is held wholly responsible for the outcome of the anasthetic, and should be thoroughly familiar with every abnormal condition of the heart and lungs abnormal condition of the heart and lungs

APPARATUS

In 1908 we began the use of the Cunningham machine, and have since seen no caute to make a change The only improvement one could suggest would be to eliminate the other chamber, so that only a pure nitrous oxide and oxygen anaxishesia could be given. We find many reports on nitrous oxide and oxygen anaxishesia, and after going into the report we will find in as inconspicuous a place as possible that these were given with just "a little ether"

"Just a Bittle ether" will admit of such a large personal equation that one would hardly know how to classify the ansisthetic. It could mean any amount from hall a dram to several ounces This kind of anesthesia has had a tendency to unjustly subject nitrous ovide and ovygen to much criticism, as the nausea, vomiting, and other unpleasant effects are always in evidence where "just a luttle ether" is used. The comfort and pleasure associated with the taking of a nitrous oxide and ovygen anaesthesia, where there is no ether added, is one of the strong points in favor of this anaesthetic. This is not the case where ether is used.

Patients who take nitrous oride and onygen never dread the second anasthetic if it becomes necessary, while those taking ether anticipate the second with dread.

Any apparatus in which the gases can be mixed in definite proportions is all that is required. The very large tanks of gas are decidedly preferable to the smaller, as the gas can be made to pass through a gauge, and a constant flow can be maintained into the bars.

REPREATEING

The question of rebreathing of the gases is one which has been much discussed, and there are men whose opinion is certainly worthy of careful consideration who advocate this. The two arguments advanced are that this renders the nitrous oxide and oxygen method much cheaper, and that the CO2 is a respiratory stimulant. The first is certainly no argument, as the question of cheapness should never be considered when we are dealing with a human life. That CO, is a respiratory stimulant has been proven, and in many cases it is extremely useful. It would certainly seem to be far more desirable if we could furnish this respiratory stimulant to our patient in the proportion we wish than to depend on our patient manufacturing the CO2, if a respiratory stimulant is required I do not think anyone will contend that the other products of expiration would be an advantage If so, then our mode of constructing buildings is all wrong. We have always endeavored to so construct and ventilate our public buildings and bedrooms that rebreathing might be eliminated. We can easily dispense with rebreathing if we desire to give an anæsthetic free from all poisonous products by adding to our machine a small tank of CO:. This is manufactured by the same concern which manufactures the other gases I have during the past year used this method of stimulating the respiration where a respiratory stimulant was demanded, and it has proven very satisfactory indeed

Other questions to be considered are whether or not it is dangerous to permit patients to breathe from a gas bag into which other patients have breathed, many of whom may have been tubercular. This would certainly seem to be a very excellent medium through which the disease might be communicated, and I am quite sure none of the enthusiastic advocates of rebreathing would look forward with pleasure to breathing from the same bag into which a tubercular patient had just exhaled. I do not think the bags, tubes, and machine can well be sterilized after each operation, as the bags I have seen would not bear boiling, which is the only sure method of sterilization.

COMPLICATIONS AND ALARMING SYMPTOMS ON THE TABLE

The greatest danger from a nitrous oxide and oxygen anæsthesia is failure of respiration. This can in most cases be overcome by the careful watching of the respiratory excursion, and the giving of the proper percentage of oxygen and CO₂. One can cause his patient to breathe just as he desires by the use of the carbon dioxide gas. Often, before we began the use of the carbon dioxide, we would have a suspension of respiration, which would be easily overcome by giving a light blow over the epicastria area.

The heart does not seem to be in the least added if plenty of oxygen is given. If we permit the patient to become cyanotic, the pulse rate is decreased; or if he come too far out from under the anaesthetic, the pulse rate is at once increased.

POST-OPERATIVE COMPLICATIONS

I think it is the accepted conclusion of those who have devoted any study to this form of anæsthesia that we have none of the postoperative complications so often seen after ether and chloroform

MORTALITY

No one will deny that there is a mortality rate to nitrous oxide and oxygen anestbesia. What that rate is I do not think we can say until many more thousands have been given,

I think, however, that many of the deaths reported should not be charged against the anæsthetic, and this agent condemned, for it is often administered by one who knows nothing of this anæsthetic, and more frequently they are mixed anæsthesias, and not nitrous oxide and oxygen at all.

In the giving of several poisons it is unfair, should evil result, to select one and lay the entire blame to it, when the symptoms and death could as easily be induced by any one of the agents used. In a recent correspondence relative to a death in which ether and natrous oxide and oxygen were given, the aneathetist maintained that, the death being due to paralysis of respiration, it was of neces sity a nitrous oxide death. I note the report of a death from ether aneathesia by the late Matrice II. Richardson. Ilad nitrous exide and oxygen been used in conjunction with the ether, I am quite sure it would have received credit for this death, as it was from paralysis of respiration. Artificial respiration was performed for 21 hours, but never during this time did the patient make any effort to breathe. While the artificial respiration was performed the patient remained pink, but the moment it was discontinued she began to grow cyanotic.

ADVANTAGES OF NITROUS ONDE AND OXYGEN AN ESTRESIA

Rapidity of action

- 2 Lack of unpleasant sensations to pa-
- 3 Absence of post-operative complica-
 - 4 Reduction of post operative vomiting 5 Absence of blood changes
 - to Lessened liability to shock
 - 7 Rand return to consciousness
 - 8 Lack of dread should future anasthetic
- be demanded In briefly discussing the advantages of a properly administered nitrous exide and oxygen anasthesia, (1) the rapidity with which the patient assumes the uncon-cious state is very desirable, and he does not have the ten minutes or more of the irritating action of ether on his air passages. I note that some of the gas origin aniesthetists state they have the patient ready for operation in thirty seconds. This is surely a mistake, and will often be accompanied by marked eyano sis. It is best, in my opinion to take at least three or four minutes to get your patient thoroughly anasthetized, and he will be a much better subject for operation than where he is hastily "pushed under" the anasthetic (2) He does not have any unpleasant sensations, regardless of the manner of administering the gas I have given this anaesthetic to many doctors, and they all say the sensation of going under the gas is very pleasant indeed. They usually report having very extensive dreams, but can seldons recall of what they dreamed. (3) The absence of post-operative complications is very noticeable. I have never seen a case of pneumonia or nephritis follow

the use of nitrous oxide and ox nen. (4) The post-operative xomiting is greatly reduced in frequency, and the prolonged xomiting quite frequently seen after other or chloroform is never seen. If the patient is placed in the Trendelenhurg position he will quite frequentby regurgitate water and gastic juice while y tegurgitate water and gastic juice while the table. (5) Absence of blood changes has been worked out by Hamberger and Ewing

In those patients who are so proloundly septic we do not so olten find shock present, and there is never the rapid march to a latal termination which is so often seen following ether. They rapidly return to con-clousness, and are in much better condition to fight the infection than they would be if there had been added to their already poisoned condition another toxic element. Any surgeon who has ever found it necessary to again operate on a patient is familiar with their great dread of again taking ether. In most cases this is far greater than the dread of the second operation.

DISTRIBIANTIGES

- t The necessity of a trained anne-thetist for this class of annesthesia
- 2 Cost of the anasthetic agent
- Rigidity and movement in some cases Under disadvantages one would place first the necessity of a trained anasthetist, but I doubt if this should be done, as the same might apply to the art of surgery. One never hears that the great disadvantage attending a grave surgical operation is that it requires a trained surgeon, or that the great disadvantage in the management of a ease of typhoid fever is that it requires a trained physician It is taken for granted that the latter two should be trained, and the same should apply to the former. The rigidity of the muscle, and movements of the patient is sometimes annoying to the surgeon, but in a great many of these cases if the surgeon will exercise patience the anasthetist can get the subject more deeply under the anæsthetie, so that a difficult ligation or other procedure can be more easily accomplished

One point of interest is if these movements are due to the pain from manipulation, and if it is harmful to the patient All patients will tell you they felt no pain during the opera-

tion, though they may have shown signs of pain during its progress. A point worth considering is that one may have a nerve extracted and other painful dental work done while taking a very slight amount of gas, and they will feel no pain, although they will obey the command to spit the saliva from their mouths. Again, Dr. Dawson has used this quite extensively in obstetrical work; and the patients will say they recall quite well when the child was born, but felt no pain at its birth It would seem if there is no pain under so slight an anæsthesia, there would be none if the anxisthesia were pushed beyond this stage. I have seen no evil results following in those cases where the patients were not thoroughly relaxed and moved, but it is much more difficult to perform the operation

Having used this anaesthetic during the past five years, and obser od its administration in 2500 cases, I feel I know something of is good and bad qualities, but I fully appreciate how far from settled is the question of the best method of producing anaesthesia at the present day. We find the surgical world

is becoming more interested in this very important field, and it is to be hoped that at no very distant day this question may be answered

CONCLUSIONS

- 1 That this anaesthetic may be administered in all cases where a general anæsthetic is required I would not presume to say it is the best in all cases
- 2 That it may be used without the addition of ether or without the preliminary of morphin
- 3 That most adults take the anæsthetic caser and are better subjects for the operation if a preliminary of morphin, gr 1/100, is given

4 That children should never be given morphin before operation

- 5 That the recoveries in patients suffering with severe septic infections are much greater
 - when this anæsthetic is used

 6 That we do not have any post operative
 complications when this anæsthetic is used.
- 7 That it should never be given except by one thoroughly trained in this work.

ANÆSTHESIA AND ANOCI-ASSOCIATION

BY GEORGE W CRILI M D CLEVELAND

RINCIPLE The nerves whether of the special senses or of common sensation, are fuses, which when ignited (that is, stimulated) cause release of energy in the magazine (the brain cells) Inhalation anæsthesia puts to sleep only a portion of the brain, if all of the brain were anaesthetized the patient would be dead Now the vast army of awake brain cells re spond actively to the trauma of operation This response, or release of energy in the brain cells, is an effort to escape from injury, and this release of energy is not prevented by inhalation anæsthesia The stored energy of the brain cells is therefore consumed during surgical operations or during psychic strain The prevention of this consumption is one of

the great outstanding problems of operative surgery Obviously the only practical method of preventing the consumption of this stored energy of the brain cells is the development of a new principle of operative surgery, the practice of which will exclude from the brain the stimuli of the special senses and the stimuli of common sensation

This is the principle of anoci-association, meaning the exclusion of all nocuous or harmful associations or stimuli.

There is not a single anaesthetic that will evclude all nocuous or harmful stimuli from the brain Local anaesthetics, by blocking nerve conduction, protect the brain from local operative injury, but they do not protect the brain against destructive psychic strain,

Read before the Clinical Congress of Suspense of North America New York Cay November 12th 1912

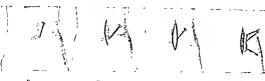


Fig 1

Fig 2

Fig 1 Infiltration of skin and subcutaneous tissue with 4hd novocain
Fig 2 Infiltration of fascia and muscle

Inhalation anæsthetics exclude the psychic stimulation of the brain cells, but do not exclude the operative stimulation. Anæsthetics introduced hypodermically are excluded on principle Each anaesthetic covers only a part of the field, each has its advocates. but there is no single agent that alone can produce anoci-association, which is the goal of operative surgery. We therefore do not advocate ether alone, nor chloroform alone. nor nitrous oxide alone, we do not advocate local anæsthesia alone, nor morphin and scopolamin alone, nor spinal anæsthesia alone; but through selection and combination of the various anaesthetics, we aim to exclude on the most favorable terms all stimuli from the brain

The description of this technique will be limited to abdominal and evophthalmic goiter operations, which will serve to illustrate the principle

ABDOMINAL OPERATIONS

- I Excluding infancy, old age, and depressed vitality, we first administer, as an average I grain of morphin and 11 grain of scopolamin one hour before operation
- 2 If local anaesthesia alone is employed, novocain in 410 solution is used by progressive local infiltration
- 3 If inhalation anæsthesia is employed, we then administer nitrous oxide, either alone or with other added as required
- 4 As soon as the patient is unconscious, infiltration, first of the skin and then of the subcutaneous tissue, with *do novocain is made. In order to spread the novocain,

Fig 3 Infiltration of posterior sheath and pentoneum Fig 4 Peritoneum inverted Infiltration with 55 per cent of quant and urea hydrochloride

immediate local pressure with the hand Is applied Amesthesia is immediate, Indison through this anasthetized zone exposes the fascia The fascia is then no ocanized, subjected to pressure, and divided This brings us to the remaining muscle or posteror sheath and to the portioneum These structures are then infiltrated with no ocain, subjected to pressure, and divided within the blocked zone. If blocking has been complete, upon opening the ablomen no increased intradominal pressure will be found, no tedency to expulsion of the intestines, and no muscular rigidity

s The peritoneum is everted and infiltrate tith ½ per cent solution of quinn and ure hydrochloride completely surrounding the line of proposed sutures and momentary pressure is applied. This infiltration serves as a block, and as it lasts see cral days it should prevent or at least minimize the post-operatite wound pain and the post-operatite gas pains, and by so much minimize post-operative and by so much minimize post-operative hydrochlorides.

6 The relaxed abdominal wall will permit the gentle and easy exploration of the entire abdominal cavity. If there is no cancer in the field of operation and no acute infection, the following regions may be blocked as completely and in the same manner as the abdominal wall, via: the me-o-appendit, the base of the gall-bladder, the uterus, the broad the round fligaments, and any portion of the particular perionicum. Operations on the stomach and intestines made without pulling on their attachment eause no pain, hence require no novocain block. Quiain and urea cause.

a certain amount of cedema of tissue, which lasts for some time after the wound is healed The closure of the upper abdomen is then

as easy as the closure of the lower - all is done with the ease of relaxation What is the result? No matter how extensive the operation, no matter how weak the patient, no matter what part is involved, if anoci technique is perfectly carried out the pulse rate at the end of the operation is the same as at the beginning; the post-operative rise of temperature, the acceleration of the pulse. the pain, the nausea, and the distention are minimized or wholly prevented

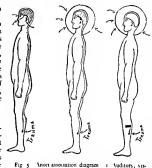
GRAVES' DISEASE

I believe everyone will agree that a technique that can carry an advanced exophthalmic goiter case through operation without increasing the pulse rate can even more readily do as much for any other operation can be done by the following technique, the

operation being either ligation or lobectomy If ligation is made, it is performed without removing the patient from his bed forming ligation nitrous oxide may or may not be administered, but a complete local block ing with novocain is always employed during operation as is also a complete quinin and urea hydrochloride infiltration at the close of the operation, thereby blocking the entire raw field of operation

If lobectomy is to be performed, the patient is anæsthetized with nitrous oxide in his own room; fictitious anæsthesia having

been daily given for several days previous to the operation, the patient is anæsthetized free from psychic strain, being under the impression that he is receiving an inhalation treatment. When under anæsthesia the patient is taken to the operating room The division of tissue is preceded by a complete blocking, so that no activating impulse can reach the brain. Before closing, quinin and urea hydrochloride is infiltrated into every part of the raw field with a hypodermic needle. The patient is kept unconscious, under anæsthesia. until returned to his room, put to bed and his room restored to its previous condition In the course of the cycle from his room to operation and return, the brain has received



ual offactory, and traumatic nort impulses reaching the bram 2 Auditory, visual elfactory associations excluded 3 Nerve blocked by cocain, patient in anociassocration

no activating stimuli so there can be and there is no change in the pulse

The immediate control however, is not the end of the benefits. The post-operative hypothyroidism is prevented or minimized and to the same extent that the immediate results are improved so are the later clinical results improved

What happens to a case of Graves' disease not under surgical treatment when subjected to a severe psychic shock -- to a heavy strain or to deep worry? The disease is aggravated for weeks or for months, and not infrequently death results The stress of facing the operating room is not only immediately seen, but is perpetuated in the following days and weeks and months by its frequent recall From this handicap the anors patient is free. and by so much is the convalescence sped on its way

SUMMARY

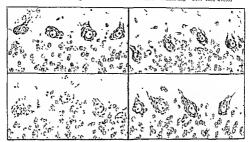
The technique of surgery the world over is now well standardized

2 One of the greatest outstanding problems is the elimination of the harmful effects of the

CEREBELLUM

Normal dog

Anora shocked dog Cerv cord severed



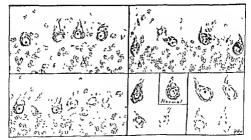
Shocked dog I ther angethesis

Shocked dog No anasthesia

CEREBELLUM

Normal rabbat

Rabbit Fright



foght

Rabbit two hours after fiight

Characteristic changes

Characteristic changes in brain cells in Iright in brain cells in shock Hyperchromatic during Note swelling and rup-linght Exhausted after ture of nucleus and nistbodies

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Anacci

Chart 1 Abdominal hysterectomy. The lemperature Each heavy line represents the average 500 p m tem perature of ten patients during the first four days after operation. The pulse. Fach heavy line represents the average 500 p in pulse rate of ten patients during the

Anoci)

here four days after operation.

after operation

after operation

are cessary surgical procedure, including the anaesthetic, thus further diminishing the post-

operative morbidity and mortality
3 These harmful effects are now known to
be due to exhaustion of the brain cells from
psychic and traumatic stimulation

4 These traumatic stimuli reach the brain and cause discharge of brain cell energy under inhalation anæsthesia

5 This brain cell activity is accomplished through oxidation

6 Mitrous oxide owes its anesthetic properties to its interference with the use of oxygen by the brain cells, hence nitrous oxide by so much protects the brain cells during a surgical operation by diminishing the ovudation, and hence the destruction of the chemical compounds in which is stored brain cell energy.

7 Powerful stimuli, whether psychic for traumatic, whether received by the bram while anake or, in case of the traumatic stumoll, whether received under inhalation annothesia, cause a lowering of the threshold to stimuli. This lowering of the threshold is the source of the nervousness, irritability, and altered personality which so frequently follow operation.

8 The principle of anoci is the exclusion of all harmful stimuli

9 The practice of anoci requires careful personal management united with the use of such chemical agents as, combined, will exChart 2 Thyroidectomy. The temperature Each bears line represents the average 500 p m temperature of ten patients during the first four days after operation. The pulse Fach heavy line represents the average 500 p m pulse rate of ten patients during the first four days after operation.

clude from the brain all harmful stimuli, thus taking the brain and the personality of the patient unmodified and unimpaired through the operations

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Chart 3 Mortality rate per thousand of operative

no The patient is kept safely and agreeably nuconscious while the operation is performed under local angesthesia.

CLINICAL RESULTS

The cluical results here reported have been confirmed by Blood(good in his personal experience The accompanying charts show the results of a critical study of the clinical data of parallel series of operations performed by me, viz the last consecutive operations under ether alone, under nativous ovide alone, and under anoci. Were it possible to express the subjective sensations of the patient, the contrast would certainly be even more striking. My associate, Dr. W. E. Lower, and I during the past year performed 629 abdominal sections, under anoci association with a mortality rate of 17 per cent.

INVERSION OF THE UTERUS

WITH REPORT OF A CASE OCCURRING DURING THE PUERPERIUM AND CAUSED BY A FIBROID

By WALTER CLINTON JONES, A. M., M. D., CHICAGO Assistant Professor of Surgical Pathology, Medical Department. University of Hanon

HE following case occurred in the experience of the writer and led him to a special study of this condition.

Pattent, Mrs. T. J., sep., 43 years. General health, good all the rife. She had korne eight challeren, so particular difficulty having occurred in any of the labors. Her last child was been abous June 30, 1912. Pregnancy, and labor were normal and the puer-permum unvestedful full the end of the second week, after delivery. She was allowed out of bed on the accordance of the second week after delivery. She was allowed out of bed on the have moderately severe perice pains, as bean of the second week and the second was allowed to the second was done sensation in the pelvis and dissura. Not until these symptoms had contoursel for a fee bed with the second was deal in her family physician, Dr. E. C. Hamitton. He took, her at once to the beeal beyand, and upon examination found a mass of maleinate shape upon examination found a mass of maleinate shape the must be more than the more than the second was the second w

hard the control of t

filtromy oma attached to the fundus by a broad base. All was well that the tenth day, when the pattent began to show a moderate temperature. At this began to show a moderate temperature. At this see the pattent for the first time. Vaguod examins toon revealed the vaguod sempty and a cervix didated about three quarters of an inch. B immanually in the median line, a mass was palpable, spherodal in shape, indefinite in outline, exther sold in consecuency and appropriate justices in diameters of the control of the unit was applied to the property about 3 inches in diameters.

I did a laparatomy at once and removed the right tube (the left one had been transord with the sagnal mass), both ovaries and a piece of omentum nearly as large as a hear's eig. All of these structures were matted together capping the crivical stump with an inflammatory mass, in the center of aboth was an an inflammatory mass, in the center of aboth was an Drainage was accomplished with nodofort gazine, both adodomatally and vagnally. The patient got along very well for about a week, when she began to have temperature and local evidence of retention of pus. I then dilated the cervix with the index finger, thus facilitating drainage. Her condition improved at once and she ultimately made a complete recovery.

PATHOLOGICAL ANATOMY

Gross The specimen (Figs 1 and 2), when I first saw it had been presented in formalin solution. It consists of an upper portion the corpus uteri, and a lower part, the tumor, which is connected with the fundus of the uterus by a broad pedicle. The body of the uterus is about o cm in diameter and the tumor, about 10 cm. The length of the whole specimen is about 20 cm. It weighs one pound and six ounces The serous surface is perfectly smooth and glossy but thrown into folds on account of the lessened area it has to cover The mucous surface is smooth but not glossy, though under tension on account of being stretched over an area larger than normal. The left tube is attached to the inner or scrous surface and is entirely normal in appearance, while hanging from it near its distal end is a small cystic hydatid of Morgagni

The uterus is light in color and very firm in consistency, while the tumor is of a darker bue and a little softer. The thickness of the wall of the uterus is about 31/2 cm and the wall of the tumor, about 2 cm In the interior of the tumor is a cavity which in the fresh specimen must have been spheroidal in shape and large enough to contain 5 or 6 ounces of fluid. At the most dependent portion of the tumor is an opening into this space, irregular in shape and about 134 cm in diameter. The surface of this cavity is somewhat irregular in contour, presenting in places a smooth surface, in other areas, indentations, due very likely to shrinkage of the tissues in the formalin solution. In

numerous spots, tags and shreds are hanging to the surface; at the outlet of the tumor cavity, these tags are large and numerous and hang downward, forming a tuft

Microscopical. The diagnosis of the tumor is typical degenerated fibromyoma. The fibrous tissue is more abundant than the muscle cells, and the degeneration is rather hare in amount and diffuse in its distribution.

This inversion is unique in that it had a double origin, a gynecological and an obsett rical. The tumor alone very likely would not have produced the inversion, for very few uterine tumors, even when submucous or intrauterine, cause this trouble, but after the uterine wall was softened by pregnancy and relaxed by a labor, the weight of the tumor became effective in pulling down the fundus on the other hand, this case is not unique.

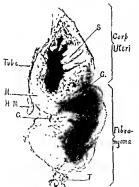


Fig 1 Photograph of gross specimen of inversion of the sterns, winter's case G, groove between tumor and uterus H M, hydated of Morgagin M, mucous surface of the uterus S, serous surface of the uterus T, tags of tissue at coulter of tumor cavity

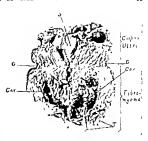


Fig 2 Same as Fig 1 showing cut surface after longitudinal incision. Cav., cavity of tumor G, groove between tumor and uterus S, serous surface of uterus T, tags of tissue at outlet of tumor cavity.

but is like a large proportion of the reported cases in that the occurrence of the accident was unforescent and could not have been avoided. The fibroid never had caused a single symptom, the labor was entirely normal, and the inversion produced such mild symptoms while it was taking place that a doctor was not called until the fundus was in the vagina. Also, the situation of this tumor at the fundus is perfectly typical, for, according to Thorn, nearly 90 per cent of fibroids which cause inversion are in this location.

In consulting the reports of several hundred cases in the literature, the writer finds only two instances in which the inversion was due to a tumor and occurred also during the pureprium Patrick of Montreal, in 1908, described such a case from his own practice, in which the inversion probably occurred gradually from the fifth to the twentieth day of the pureprium Tracy (ropt;) also describes a case of his own of 14, years' standing, which was due to an intramural fibroid in the fundus and which had developed during her last pureprium.

Pench has collected five instances from the literature in which the uterus was removed through mistaking it for a tumor. One of these patients died

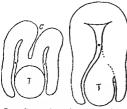


Fig. 3. Diagram of incomplete inversion of the uterus caused by a submucous fibroid situated near the fundus and simulating an intrusterine polip without inversion. C, cup-like depression on the peritoneal surface. T, tumor Note the shortened intrauterine cavity (**) Compare Fig. 4 in which the findings at the external os are precisely similar.

Fig. 4. Diagram of an intrauteme fibroid without inversion, from a recent patient of the whiter's. T. tumos Note the clongated intrauteme space (*). Compare Fig. 3, in which the findings at the external os are precisely similar.

briefly and approximately in the order of

their importance the causes of inversion of the

A Obstetrical in Origin I Primary cause

r Relaxation of uterus

Etrology

II Secondary causes

t Pressure on fundus from above or traction from below

The following outline gives

 Traction on cord (including short cord or cord wound around baby).

b Crede expression of placenta

2 Any factor favoring uterine inertia

a Prolonged labor

b Hydramnion c Multiparity (?)

d Constitutional diseases, etc

3 Age a 20-30

a 20-30 4 Idiopathic

B Gynecological in Origin

r Usually submucous or intrauterine

2 Age After 30.

II. Idiopathic.

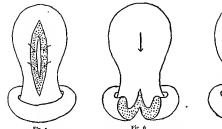
In 1911, Thorn, in what is probably the most exhaustive research of the literature that has ever been published in the history of this subject, reported 641 cases gathered from the entire civilized world and covering a period of 22 years prior to 1911. Of these, 521 (81.2 per cent) were obstetrical (full term) in origin: 83 (13 per cent) were due to tumors of the uterus; 14 (2.2 per cent) occurred post-mortem; 13 (2 per cent) he classified as idiopathic, and 10 (16 per cent) occurred after abortions or premature labors. From these statistics it is evident that a discussion of this subject centers around the obstetrical instances, as this class outnumbers so greatly all others. In this group, according to Moran, inversion happens with about equal frequency before and after the delivery of the placenta. It may occur during the delivery of the baby (Barnes and Chittenden).

The following statistics will give one an idea of the rarity of this accident.

Von Braun z case in 250 000 labors Madden I case in 190,800 labors Cache I case in 4 600 labors o case in 20 000 labors Winckel. o case in 250 000 labors Beckman Aveling I case in 100 000 labors I case in 140 000 labors Hirst I case in 2,000 labors Kehrer 2 cases in 1,500 labors Schonbeck I case in 200 oon labors Krassowsky 1 case in 128 767 labors Average

There is some doubt, in regard to some of the above statistics, as to whether they refer to inversions of all degrees or to complete ones only Furthermore, the above table is compiled from hospital reports and hence, Mërnel and others hold, is misleading because this accident, they maintain, is relatively more common in private homes. Hinchey upon examination of the mortuary reports of St Louis and after a search of the literature, concluded that this accident is more common than is usually supposed. Thom expresses the same continuous.

In searching for the etiology proper of uterine inversion, one need not go far to discover that the great underlying cause of all acute (obstetrical) cases is relaxation of the



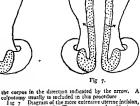


Fig 5 Diagram showing the uterine incision in the posterior wall in the operation of Browne and of Kustner in the former method, the cervix is dilated through this incision, in the latter, the cervix is reached through a posterior colpotomy and the uterus is turned insaed through the uterine incision, as indicated by the arrows (Moddérd from Henricus).

(Moduled from Heinricius)

Fig 6 Diagram of simple cervical incision, usually
made posteriorly. Reduction is accomplished by pressing

usually made posteroidy. The inversion is reduced by turning the uterus in the direction indicated by the arrows. A colpotomy is almost always done as a part of this method Note that this prolonged incision may be made by extending downward the incision bloom in Tig. 5 or by continuing upward the one seen in Fig. 6 (Modified from Heinricus).

Probably none of the secondary ulcrus. factors which are active during or immediately after labor would ever produce inversion without uterine inertia. Of course, this statement does not apply to gynecological cases, for they are gradual in their development. Although uterine relaxation has been emphasized by Dudley, Ashton, McGlinn, Exchaquet, Mériel, Murphy, Lynch, Baseil and others, yet it will bear repetition here, for there are many who do not seem to appreciate its importance. Numerous writers are vociferous in condemning midwives, especially, and also physicians, for traction on the cord or an "improper" Credé. This, to be sure, is all right as far as it goes, but it does not get at the root of the trouble. Most authorities in obstetrics condemn in general any traction on the cord, but usually recommend Credé's method. As far as anyone knows, either procedure may easily produce inversion, if the uterus is relaxed. Why not, then, lay emphasis watching the tonicity of the uterus and upon the importance of carrying out no procedure whatever upon the uterus or its contents during the second or the third stages of labor (except in emergency), unless the uterus is firmly contracted? If this rule were observed, many cases, perhaps half of them, would be prevented. In 100 tabulated cases, Vogel found in 47 instances that traction had been everted upon the cord, while Thorn cited 11 cases in which the cord either was short or was wound many times around the body of the baby. Funct traction probably is more common as a secondary cause of inversion than is pressure upon the fundus

There remains, however, a large number of instances which seen at present to be entirely unavoidable. I refer to those that occur during or immediately after a normal or approximately normal labor which has been conducted according to the most thoroughly approved methods. In these patients, the accident occurs suddenly and without warning, once in a while even without symptoms (Barrows and others); and the fundus is down in the vagina before there is any possible chance to prevent the inversion. For the present, at least, we must call these instances

spontaneous. In 100 acute cases, Beckman found 54 to be of this nature. Of 437 post-partum inversions, Thorn finds that 145 were produced by violence, 180 were spontaneous, and that in 103 the cause was undetermined. Thus, in 334 cases in which the cause could be accertained, 24 per cent were spontaneous. The blame in these instances lies, not in the fact that the inversion has occurred, but in the failure to make an early diagnosis and in neglecting to replace the uterus at once. In the case where diagnosis and reposition have been accomplished immediately, both the morbidity and the mortality have been very low.

In considering the secondary causes of this condition, it is by theoretical considerations rather than by practical deductions that one places among the causes of this accident those factors which usually are accepted by obstetricians as predisposing to uterine inertia, for example, multiparity, prolonged labor, hydramnion, etc ; for one is impressed forcibly in an extensive perusal of the literature, by the large number (about to per cent) of cases in which none of these factors are present. In fact, according to Thorn, Vogel and others, the great majority of obstetrical instances occur in prinsipatæ. In these patients, the usual explanation is the following (Murphy, Dudles, Ashton, etc.): It is easy to conceive how muscular contraction is interfered with particularly at the placental site and especially while the placenta is still attached. There occurs first diffuse uterine inertia: then the relatively paralyzed placental area becomes indented by funic traction of Credé expression, by the weight of the placenta or the pressure of an overfilled colon (Scheffen) or even by a cough or a sneeze on the part of the patient. uterine muscle exclusive of the placental spot regaining more or less of its tonicity, seizes the inactive placental depression as it would grasp a foreign body, and "in attempting to expel it turns itself inside out" (Ashton) The fact that inversion is more frequent than in multiparæ has an etiological significance per se, considering that most births are not first ones. Holmes thinks that a neurosis or a congenital failure of proper innervation may constitute the explanation

The attachment of the placenta at the fundus is held by Holmes and others to be an important etiological factor. As an illustration that this location is not essential, Thom reports two patients and Holmes four in which inversion occurred in connection with placenta pravia However, the fact that about 80 per cent of placenta pravias occur in multipare, finversion is more common in primipara) and that about 88 per cent of all pravia cases are delivered prematurely (about 98 per cent of obstetrical inversions occur at full term),—these statistics demonstrate that placents pravia plays a very small if any part

in producing uterine inversion.

The recurrence of obstetrical inversion in subsequent pregnancies is uncommon. In 521 cases Thorn found only 8 such instances recorded, while very many writers report cases of uterine inversion in which later labors and puerperia were entirely normal. The recurrence of inversion irumediately or very soon after reduction is unusual, Thorn reporting only 14 such instances in his large.

As to age, by far the greater proportion of all acute cases occur between 20 and 30. The following table from Beckman (1894) speaks for itself More recent statistics gathered by the writer and others show similar percentages

Under 20 years 4 pairents
From 20-25 years 35 patients
From 25-30 years 18 patients
From 35-30 years 9 patients
From 35-30 years 7 patients
Over 30 years 2 patient

Total 77 patients
Hence 73 per cent occur between the ages

There 73 per cent octar better the same of 20 and 30. This finding, however, has no purely etiological significance when compared with another fact, namely, that 75 per cent of all births occur during this ten-year period Chronic obstettical inversions found later usually date back to the second decade for their origin. Chronic ones due to tumor arise more commonly after 30, the time when fibroids are more frequently found.

Practically all instances not obstetrical in origin are caused by fibroid tumors. As a rare exception to this rule, Thorn reports four cases produced by sarcoma and two by car-

cinoma. The fibroids usually are intrauterine or submucous, rarely intramural, and they bring about inversion very gradually. The pathogenesis in these cases is similar in principle to that in obstetrical inversion. either case a weak spot is produced in the uterine wall; in the latter by the placenta, in the former by the tumor, due to infiltrative growth or pressure atrophy and to traction. The tumor by its presence in the uterine cavity stimulates the contraction of the normal uterine musculature and thus the inversion is produced.

Idiopathic inversions are those which have absolutely no ascertainable cause; that is, they do not occur after an abortion nor following a labor at full term; they do not present any tumor nor any other pathological lesion except the inversion. Olshausen has reported such an instance which occurred in a virgin 18 years old. These cases are very rare, only 13 having been reported (Thorn), as far as the

writer knows.

Pathology. As to duration, inversion of the uterus is either ocute or chronic writers consider as acute all cases which last one month or less, while those which pass beyond this limit are classed as chronic. These latter frequently exist for many months, sometimes many years. J. H Tate, for instance, used his method of reposition for the first time on a case of 42 years' standing. Practically all of the acute cases occur during or directly after the third stage of labor. Of the chronic inversions, one half or more are obstetrical in origin while the remainder are produced by uterine tumors.

In regard to the degree of inversion, these lesions are classified as complete and incomplete. The incomplete ones are those in which the fundus passes no farther than to the cervix. If any part of the corpus passes through the cervical ring, this stage is called complete by most writers, though Ashton, Murphy and others reserve this term for those rare cases in which the cervix also is turned inside out. A few extreme inversions have been reported (Boyd and others) in which the vagina also was more or less inverted. Practically all obstetrical instances are inversions of the entire corpus, not

including the cervix. Judging from reports in the literature, it is a very rare finding indeed to discover an obstetrical inversion at the incomplete stage. The writer knows of but one such instance, which was reported by Summers of St Louis. In inversions caused by tumor, Thorn found 25 per cent partial and 75 per cent total

The most important pathological point is the cervix, the control of which is the key to the treatment. In all chronic cases, it is firmly contracted In acute cases, it becomes contracted early, usually within a few hours and sometimes within a few minutes, thus preventing what otherwise would be an easy reposition Practically all therapeutic measures are aimed chiefly at overcoming cervical resistance Rigidity of the corpus, however, in some chronic inversions is very important, necessitating incision through the body of the uterus as well as through the cervix in order to accomplish reduction.

Viewing the pathological anatomy vaginally in a typical case, we find that the shape of the inverted corpus is that of a pear with the large end downward. It is large in acute cases, in chronic cases, smaller, a high degree of involution sometimes taking place in inverted uteri (Hoover and others). If the circulation is obstructed, the uterus is large and cedematous, if the circulation is cut off entirely, as has happened in a very few

instances, gangrene results (Thorn).

Whether the uterus is wholly within the vagina, partly outside, or wholly outside the vulva depends on the degree of the inversion, the amount of associated prolapse and the length of the uterus. The placenta is attached more or less completely in about half of the obstetrical inversions. Also, in these recent cases, one usually can demonstrate the openings of the Fallopian tubes while later this is difficult or impossible.

Viewing this lesion from the peritoneal side, we find at the uterine site a depression, more or less elongated, depending upon the degree of the inversion. Into this cup are pulled the inner portions of the broad ligaments, the proximal ends of the tubes and, in extreme cases, the entire tubes together with the ovaries. The omentum or the

intestines may fall down into this opening. One case of acute ileus has been reported due to this rare accident (Benson). A portion of the bladder may also be drawn in (Hin-day); and in nearly all cases, and especially in the chronic ones, there is more or less traction on this organ, producing dysuria, etc. In 83, inversions caused by tumor, Thorn found 7 instances of bladder diverticulum, and in these, vesico-vaginal fistula occurred after operation. Adhesions between the infolded peritoneda surfaces are rare, Thorn found only 5 such instances in a large series of chronic cases.

Symptoms. There may be very few subjective symptoms or possibly none at all, even in acute cases, but this is very rare, Barrows describes a very remarkable case of his own in which inversion occurred immediately after the delivery of the baby. He detached the placenta at once and quickly replaced the uterus and the patient never suspected that anything unusual had hapnened Bell and Reeve have reported similar Practically all acute inversions, however, show marked symptoms, and the most important of these come under two heads, hamorrhage and shock Pain also is a prominent manifestation. In chronic cases, if one add to the symptoms of uterine prolapse (nain in back, bearing down sensation, bladder and rectal irritation, etc.) those of hæmorrhage and its consequent anæmia, etc, the clinical picture is sufficiently complete for chronic uterine inversion.

The physical findings in a typical acute complete case are as follows: Vaginally, a large, red, rather soft, bleeding, pear-shaped tumor with minute tubal openings, one on either side of the large lower end Following this tumor upward, one finds no cervical os but instead a shallow fornix all the way around the neck of the tumor and above this the cervical ring, usually more or less contracted Abdominally, one fails to find the corpus uteri, and at the point which corresponds to the normal cervico-corporeal junction, is found a cup-like depression. This latter may be difficult to detect, except in thin-walled abdomens. In chronic inversions, the vaginal tumor is smaller, less red, not so

soft, and it does not bleed so easily; also, the tubal openings can seldom be demonstrated.

Diagnosis. From the subjective symptoms alone, one can never more than suspect the existence of inversion of the uterus. The diagnosis is made exclusively from the physical signs. These already have been described in our discussion of pathology and symptoms and need not be repeated here. In thick-walled women, one will be aided greatly in determining the absence of the corpus from its normal location by using a sound in the bladder and one or two fingers in the rectum. In acute cases, the diagnosis is easy from the vaginal findings alone. However, in one instance at least, it has been mistaken by a physician for a "bleeding tumor." When the symptoms are not acute, inversion frequently is entirely overlooked for many days or several weeks or months and in rarer instances for many years. In 191 obstetrical inversions analyzed by Thorn, to were diagnosed immediately post-partum; 44, directly after the delivery of the placenta; and 141, within 12 hours. In 158 cases diagnosed later, 67 were discovered under six weeks; 52. within six months; and 40, after one year Peterson describes a case which was not diagnosed for 12 years and Reeb, one which was overlooked for 25 years. As far as the writer can judge from the data given in the various reports, in by lar the greater proportion of the cases in which inversion is overlooked the error is due, not to misinterpretation of diagnostic signs but to neglect in

making any examination at all-The differential diagnosis in gynecological cases sometimes is very puzzling, especially when a fibroid is present simulating the corpus rather closely in size, shape and position or when the tumor is very large so that it obscures the whole field (Hinchey). Gynecological inversion without a tumor is very rare. Hence, in actual practice one usually has to differentiate only between fibroid with inversion and fibroid without inversion. The key to the situation here is the length of the uterine canal, a fibroid always producing elongation while intersion always shortens it. Fig. 3 represents a typical inversion produced by a submucous

fibroid located near the fundus. Note the shortened uterine cavity on all sides of the presenting mass. At no point will the probe pass the normal distance. Compare Fig 4. a diagram from a recent case of the writer's, where the uterine space is much clongated; the sound passes freely on all sides except where the base of the tumor prevents Similarly, if the tumor were attached to the fundus instead of laterally, the probe would pass high up on all sides of the fibroid combined with the tumor shown in Fig 4. there were a moderate inversion at its base. the length of the uterine canal would be about normal or a little less. Therefore we may say, for all practical purposes in gynecological diagnosis, that a tumor-like mass protruding at the external os plus marked clongation of the uterine canal equals fibroid without inversion. This same mass plus a normal or slightly shortened intrauterine space equals fibroid plus moderate inversion. This mass plus marked shortening of the intrauterine cavity equals fibroid plus more marked inversion. Marked protrusion through the external os with a very much shortened uterine canal probably would mean inversion without a tumor. The cup-like depression in the peritoneal side of the uterus produced by inversion is an exceedingly important aid in diagnosis whenever it can be palpated. When inversion with a fibroid is well advanced there may be an indentation between the tumor and the uterus, as in the writer's case (Fig. 1).

Dudley illustrates by diagram a puzzling condition where a subserous fibroid projects into the abdominal cavity simulating closely a corpus uteri, while the body of the uterus is entirely inverted. He does not say whether such a case has ever occurred. The diagnosis of a beginning inversion at the base of a submucous benign tumor is very important; otherwise, in removing the tumor one may cut too deeply and remove also the bottom of the tupp, this making a hole through the uterus

(Browne and others).

Prognosis. Like most emergencies, the earligracity acute uterine inversion is recognized and treated, the better is the outlook. This statement applies in less degree to chronic

inversion. If left to themselves, the majority of acute cases die of shock or hamorrhage, or later from infection. Chronic cases may last for years without marked symptoms. Beckman gives the mortality in acute cases as 14 per cent, McGlinn, as 70 per cent; Kehrer, as 25 per cent, and Crosse (1847), as 75 per cent In 300 acute inversions cited by Thorn, 64 (16 per cent) died: 33 from hæmorrhage, 14 from shock, 15 from sepsis, and 2 from lung embolism In 83 chronic cases caused by tumors (including four malignant ones), collected by the same writer, the mortality was 8 s per cent, one of these deaths being caused by hamorrhage and the rest by cachesia and infection Croisic has collated 400 cases, including both acute and chronic, in which the mortality was 35 per cent. Of 109 fatalities in acute cases, 72 died within a few hour, the majority within half an hour, 8 died in from one to seven days, and 6, in from one to four weeks In 104 chronic inversions, there were only 7 deaths. Murphy and Lynch say, "Statistics show that if the inversion is not reduced the danger after the first month is slight, but increases again with the resumption of menstruction, which is often hæmorrhagie "

Treatment Considering the comparatively small number of uterine inversions that have occurred in the history of medicine, the variety of the methods of treatment is exceedingly great. A large proportion of those who have treated this lesion either have originated new procedures or have enlarged upon older ones. The following outline gives a synopsis

of the various methods, new and old.

A. Non-Operation

- I. Spontaneous reposition.
 II. Manual reposition
 - One hand on the abdomen, the other hand as follows:
 - Indentation begun at fundus (Emmet, etc.).
 - (1) At center.
 - (2) At one cornu.
 - Indentation begun near cervix
 (Hirst, Fraser, Gurney).

 2. Two fingers on cervix through rectum,
 - both thumbs on fundus (Courty)

 Two fingers of one hand on cervix through rectum; one finger of other hand in bladder as follows:

a. Through urethra (Tate-Dandridge).

 Through vesico-vaginal incision (Dudley).

III. Mechanical appliances.

1 Tamponade of vagina with gauze, etc

2. Bags in vagina distended with water, air or mercury

 Repositors (Aveling, Lawson Tait, White, Byrne, Wing, etc.).

a Pressure exerted by arms or body

of operator.

b Pressure effected by elastic bands extending from repositor to waist belt on patient.

B. Operative

Operations upon the certix.

I Incisions.

a. Extraperitoneal (vaginal).
 (1) Incomplete (Aran, Hirst,

Barnes, Sims).

(2) Complete.
(a) Anterior

(b) Posterior (Hirst).

b Intraperitoneal

(1) Vaginal (a) Anterior

(b) Posterior (Hirst).

(2) Abdominal.

(a) Anterior (b) Posterior (Everke).

2 Dilatation.

 Vaginal, through incision in posterior wall of uterus (Browne).
 Abdominal through laparatores.

 Abdominal, through laparotomy incision (Thomas).

II. Operations upon the corpus.

r Vaginal Posterior colpotomy; longitudinal incision in posterior wall of corpus; control cervix with two fingers in posterior cul-de-sac — Kustner's operation

III. Operations upon both cervix and corpus.
Incision of the entire cervix and more or
less of the corpus.

r. Vaginal.

Anterior.

 (1) Extraperitoneal (Kehrer).
 (2) Intraperitoneal (Spinelli, Thorn, Oui).

Posterior — Intraperitoneal (Piccoli, Josephson, Morisani, Duret, Pruntsi, Borelius, Westermark, Sava).

c. a and b (Jones).

2. Abdominal

a. Anterior.

b. Posterior (Vignard, Gross, Haultain).

IV. Manual reposition with one hand through

abdominol incision (Boyd).

V. Hysterectomy.

1. Vaginal] a. Partial.

2. Abdominal b. Complete.

C. Treatment of Placenta I. Removal before reposition,

I. Removal before reposition. II. Removal after reposition.

The simplest way by which uterine inversion may be corrected is through spontaneous reposition. Thorn has collected from the literature 13 such instances in acute cases Boxall has reported a case which occurred as late as three weeks after delivery. Though a fortunate occurrence, spontaneous reduction is so rare that it cannot be relied upon except in some incomplete inversions and for the last stage of reposition in complete cases. When all of the corpus has been pressed up well above the cervical ring, the rest of the reduction is nearly always spontaneous Johnstone says, "When the fundus has been reduced within the external os . . the uterus will reinvert itself like an india-rubber cup, turned not quite half inside out." Sometimes this final stage is completed with much force Parker describes cases of his own in which it took place with an audible thud, and McGlinn, a case in which the "uterus sprang back like an indented rubber ball." Jaeger relates an instance from his own experience in which the final rebound of the uterus threw to the floor some instruments which were lying on the patient's abdomen. Thorn found 8 cases in his series in which reposition was reported as occurring with a jerk or a snap

In contrast with these experiences. Boyd describes an unusual case of his own in which he had great difficulty in completing the reposition after the fundus had been pushed up above the internal os.

Simple manual reposition is such an ancient procedure and is so widely employed throughout the entire world that I am unable to find anyone who claims to be the originator of this method. The indentation usually is started at the fundus, either near the center or at one of the horns The starting of the pressure near the cervical ring (Hirst, Fraser, Gurney) instead of at the fundus is a procedure not so widely known, though it is a very valuable detail, because in some cases it will succeed when pressure on the fundus has failed.

Manual reposition should be attempted as early as possible, before contraction of the cervix has become well marked, in order to avoid this great obstacle to all methods of reposition. In recent obstetrical inversions, if there is much difficulty on account of cervical resistance, Dudley suggests that the pressure be exerted during the intervals of relaxation between the uterine contractions a waiting policy, Hoover, of England, stands practically alone in advocating that "mere displacement should be ignored until shock. which is so frequently present, has been satisfactorily treated" In 79 cases of immediate replacement in the presence of shock, he found the mortality to be 30 per cent, while in 47 cases with marked shock which were allowed to become chronic the mortality was less than 5 per cent. He advocates an intermediate course. First he treats the shock for a few hours and then under anæsthesia reduces the inversion. Practically all other writers, on the other hand, are very insistent on immediate replacement in all acute

About 1875, Courty, realizing the difficulty in controlling the cervix, introduced the procedure of placing two fingers of one hand in the rectum and both thumbs upon the fundus. This was a helpful idea but fell far short of solving the problem for a majority of cases. In 1878, J. H. Tate, of Cincinnati, tried Courty's method on a patient and failed. At the suggestion of Dandridge, who was a spectator at the operation, he inserted into the bladder through the urethra the index finger of the hand in the vagina. Reduction was thus accomplished rather easily in about half an hour, although the inversion had existed for about 42 years Dudley has suggested that if this method be used, the finger in the bladder be inserted through a vesico-vaginal incision in order to avoid injuring the urethral sphincter.

As to vaginal tamponade and colpeurynters, comparatively little is said about them in the literature and they seem to be of but little value. In case one employs vaginal bags, if fluid is used to distend them, he must be sure it is sterile in order to avoid infection in case of leakage or rupture Gariel used a bag

which he distended with air

Mechanical contrivances to aid in reposition have been invented by a large number of obstetricians and gynecologists. Wing devised a "doughnut" pessary repositor; White, a spiral spring, Lawson Tait, a contrivance of his own, but the best known and the most widely used of all of these probably is Aveling's repositor, described by its inventor in 1886 By 1901 it had been used at least eleven times successfully, and about three failures were recorded against it. All repositors should be employed with great care. To continue their use for five or six weeks uninterruptedly, as advocated by Ashton, involves unwarranted danger from lacerations. hæmorrhage and especially infection as late as 1906, Ashton recommended manual reposition and the use of repositors to the absolute exclusion of any sort of cutting operation Fortunately, however, as the writer thinks, he stands practically alone in this extreme position.

The following statistics, compiled by Thorn, . give an adequate idea as to the relative frequency with which the various non-operative methods are used.

Manuat reposition	166 time:
Colpcurynter	16 time
Aveling's repositor	8 time
Tamponade and colpeurynter	7 times
Tamponade	5 time:
Gariel Galbin instrument	3 time:

Total

In at least 7 of these cases treated by nonoperative reposition, the uterus was badly injured.

In order to control harmorrhage, Thorn recommends that an elastic rubber tubing be drawn tightly around the base of the inverted corpus. The inefficiency of this suggestion lies in the fact that sterile rubber tubing is seldom at hand outside a hospital, also, the strangulation thus produced may itself cause

collapse (Spiegelberg). Cutting operations of a minor nature were employed vaginally on the uterus more than fifty years ago In 1858, Aran; in 1866, Sims; and still later, Barnes used superficial uterine incisions to assist in reposition T. G Thomas, however, in 1872, was the first to report the use of an extensive cutting operation for this condition In his first case, through a small incision in the anterior abdominal wall, he distended the cervix with a metal dilator and accomplished an easy reposition, the patient making a good recovery. Several others tried Thomas' method, some as he had done it, others with modifications. For example, Everke (1899) made anterior and posterior cervical incisions by the abdominal route to facilitate dilatation and reduction, while Haultain (1908), through a similar opening, made a cervical incision posteriorly and extended it into the corpus as far as was necessary to accomplish reduction Vignard, Gross, and Nunez also have treated uterine inversion successfully by this method Boyd (1912) used a laparotomy to aid in manual reposition merely by placing one hand on the cervix through an anterior abdominal incision.

Several fatalities followed Thomas' method in the hands of other operators. For this reason and because a cepiotomy seemed an unnecessarily serious operation, others sought to attack the cervical ring from below. In 1883, Browne made known his simple and ingenious procedure, which he had carried out successfully on a case of his own. He dilated the cervix through an incision in the posterior wall of the corpus (Fig. 5), sutured the incision and then replaced the uterus by simple manual reduction. Ten years later (1985), Kustnet published a description of his operation. He made a uterine incision precisely

similar to that of Browne's; in addition, however, he did a posterior colpotomy and through this opening controlled the cervit during reposition and sewed up the uterine incision after reduction. An opening for drainage was left in the posterior cul-de-sac.

Browne's operation in America and Kustner's in Germany marked the beginning of the modern and most approved method in difficult cases, namely, posterior colpotomy and incision of both the cervis and the cornus (Fig 7) Piccoli, in 1803, was the first to suggest this more extensive procedure, while Josephson, in 1894, was the first to try it on an actual case He failed, however, and performed a bysterectomy Morisani, in 1806. carried out the operation for the first time successfully. The following year it was done by Sava, and Westermark; the next year (1808), by Borelius, Pruntsi, and Duret. Most if not all of these men performed the operation without knowing that it had heen done by the others. By a rare coincidence, Borelius and Pruntsi did it on the same day (May 26, 1808). Therefore, to christen this procedure by its full name according to its fathers and godiathers, we should call it the Kustner-Piccoli Josephson-Morisani - Sava - Westermark - Borelius - Pruntsi -Duret operation

This same method was developed a little later by American operators in the following manner: I have already referred to the superficial uterine inclisions made through the cerux by Aran, Sims and others In 1900, Hirst carried this idea forward to a complete extraperitoneal incision of the cerux (Fig. 6) Very soon afterwards, in difficult cases, Hirst and others extended this incision more or less into the body of the uterus (Fig. 7), including also a posterior colpotomy

During almost exactly the same years that Josephson, Duret, etc, were perfecting their nethod, Kehrer, Spinelli, Thorn, Oui, and others were developing a precisely similar operation anteriority. Kehrer in 1898 reported has method of using an extraperitoneal incision extending through the entire anterior wall of the uterus. As he replaced the uterus, he inserted the uterias sutures before any given portion of the uterus had been pushed in

too far to be reached with the needle. Spinnelli used this same method, with the addition of an anterior colpotomy; through this opening, reposition was facilitated and the incision in the uterus could be sutured after reduction of the inversion. In either the anterior or the posterior colpohysterotomy, if the incision is extended throughout the entire fength of the uterus, the whole procedure of incising the uterus, reducing the inversion, and suturing the uterine incision usually is done wholly within the vagina; afterwards, the uterus is put back into the pelvic cavity through the colpotomy incision.

Hysterectomy may be done on account of one or more of the following indications:

1. Marked infection. This is the most common valid reason.

Gangrene. (Rare; three cases are reported, by Hutson, Steele, and Mérief.)
 Here, of course, bysterectomy is imperative.
 Tumors: a. Malignant (Thorn has

found 6 such cases, 4 sarcomata and 2 carcinomata); b. Benign tumors involving

a large part of the uterus

4. In chronic inversions past the menopause, for the same reasons that a hysterectomy might be done at this age for a marked prolapse without inversion.
5. Instances where reposition is impossible.

This indication ought to be exceedingly rare.

6. Welss (1912) considers hysterectomy
"the method of choice in chronic inversions

of puerperal origin." This extreme position seems to the writer to be entirely unjustifiable Of course, the vaginal route should be cho-

so linears of infection or gangrene. In the cases of inversion with tumors, the inversion was was ally iso faccionary importance, so that the treatment is determined mostly by the nature, size, position, etc. of the tumor, a discussion of which is not pertinent here. There have been several cases recorded in which hysterectomy was done for the sole reason that reduction could not be accomplished (Josephson, Hoover, etc.). For these instances the writer suggests a combination of procedures which, as far as he knows, has never been tried, namely, both anterior and posterior colphysterotomy. Incise the cervix on both sides and extend one or both incisions as far as necessary

toward the fundus. Then, with the fingers of both hands passed through the colpotomy inctsions, onto the doubly divided cervix and with the thumbs of both hands on the portion of the fundus which remains undivided, it seems that the most ancient and intractable case ought to be overcome so that there would be no excuse for removing a uterus on account of inversion alone

In regard to the safety of the various operative methods in acute inversions, the following statistics collected by Thorn are very instructive:

Lind of Operation	No of Cases	Morta
Laparotomy	24	21
Vaginal Hysterectomy		
Total	28	7
Partial	26	4
Colpohysterotomy		7
Posterior	42	۰
Anterior	8	۰
Total No Cases	128	_
Av Mortality		6

Among the haparotomics, there were five failures of reposition. These together with the high mortality speak strongly against this method. Considering especially the safety of colpohysterotomy and also its efficiency and the relative ease with which it may be done, one is not justified in making prolonged efforts at manual reposition or in trying repositors for more than a few hours. In all acute cases, simple manual reposition should be tested first; and usually it will succeed. In chronic cases it may be tried, and sometimes success will ensue, especially it some modification is used (Courty, Tate-Dandridge, etc.).

In using the method of colpohysterotomy, one should make only the cervical incision (Fig. 6) or the incision in the corpus (Fig. 5) at first, and then attempt reduction. In case the lesser incision fails, prolong it as far as necessary, making the complete incision (Fig. 7) or even both anterior and posterior incisions if necessary.

In a few instances, on account of a small vagina or a farge uterus or a large tumor, etc., it is best or even imperative that one select the abdominal route.

In incomplete inversions operative treatment is seldom required for the inversion itself. One does have to operate, however, on

the concomitant tumor, which usually is the causative agent in these instances.

The following statistics from Thorn show the relative frequency with which various operative procedures are employed in cases of inversion caused by myomata.

Spontaneous separation of myoma 3 03505 Enucleation of myoma 35 cases Amputation of uterus 10 cases Total vaginal bysterectomy La cases Combination of methods 3 cases Unoperated 3 Cilses

Total No. cases

In the 35 cases in this table in which enucleation of the tumor was accomplished, the treatment of the inversion was as follows:

Spontaneous reposition I4 cases Manual reposition IO CASES Colpcurynter 4 cases Tamponade 3 cases Kustner's operation i case Reduction by laparotomy I case Unreduced (one complete, one partial) 2 cases

Total No cases

35 Of the 10 cases in which the corpus was amputated, in three instances reposition of the cervical stump was spontaneous Thus we see the importance of spontaneous reduction in this class of cases, especially in instances of simple enucleation of the tumor, where its frequency is 40 per cent.

The treatment of inversion by surgical methods occupies such a large place in the literature that one is apt to acquire an evaggerated idea as to the number of cases in which it is indicated Probably at least 75 per cent of all inversions are treated best by manual reposition and other non-cutting procedures, but in the relatively small number in which operation is necessary, the need for it usually is very urgent

TREATMENT OF THE PLACENTA

There is considerable disagreement in re-Dudley, Ashton, Thorn, gard to this subject and many others advise removal of the placenta before reposition, while Murphy and Lynch, Barrows and others replace the uterus without previous separation of the placenta, chiefly, they maintain, in order to avoid hæmorrhage. Still others assume an intermediate

position, namely, removal if it is partly detached or reposition with the uterus if it is still entirely adherent. Byford, many years ago (1873), advised this course. Here, again, the main key to the situation is the contraction of the cervix

Reasons for replacing placenta:

- I To avoid hemorrhage, especially in extreme uterine relaxation -a very important point. Boyd, however, describes a case in which the hemorrhage "became alarming and continued until the placenta was detached "
- 2 To avoid loss of time. If the placenta is adherent, enough time may pass so that a relaxed cervix may contract and thus make reduction difficult or impossible. This is a valid reason

Reasons for separating placenta before reposi-

- r If adherent, it may be much more difficult to remove after reposition - a demonstrated fact (Fraser).
- 2 The placenta, by its bulk and unwieldiness, may prevent reposition if the cervix is contracted, this has occurred several times (McGlinn)
- 3 By its weight the placenta may cause reinversion (McGlinn), especially if the cervix remain relaxed.
- 4 Since the placenta is the portion of the descending mass which comes down farthest, often protruding outside the vulva, it is more likely to become contaminated. Hence, if possible, avoid placing it back inside the uterus. This is a very important consideration

The majority of those who have actually treated cases of obstetrical inversion have senarated the placenta before attempting reposition and they hold that usually this is the best course to pursue. Thorn says that "reposition of the placenta would be indicated only when the placenta is completely adherent when also there is no hamorrhage, and when further it is impossible to apply constriction at the isthmus to control hæmorrhage -- a combination of circumstances which would occur very rarely." Thorn's position is somewhat extreme. On the whole, replacement of the placenta seems to be allowable if

it is not contaminated with infectious material and if the cervix is not contracted.

SUMMARY

- 1. Etiology. In obstetrical inversion, the primary cause is uterine relaxation. The chief secondary factors are pressure on the fundus and traction on the cord. In inversion not obstetrical in origin, uterine fibroid is almost the exclusive cause.
- 2. Pathology. Most cases are both acute and complete; in the complete ones, the most important point is the degree of contraction of the cervix. In inversion of gynecological origin the causative tumor is of pre-eminent importance.
- 3 Symptoms. In acute cases, the cardinal symptoms are hamorrhage, shock and pain. Later, the manifestations of a complicating infection may appear In chronic inversion. the symptoms are those of marked uterine prolapse plus those of menorrhagia and metrorrhagia.
- 4. Diagnosis. This is made from the objective findings exclusively. In obstetrical inversions, it is almost always very easy. Vaginally, a large, soft, pear-shaped, bleeding tumor is found, with the placenta attached in about balf the cases. Abdominally, no corpus Is found, and in its place there is a cup like depression. In gynecological cases, the diagnosis of inversion due to a fibroid frequently ls very difficult. The chief points are first, the shortening of the uterine canal produced by inversion as compared with the lengthening caused by a fibroid; and secondly, the indentation produced by the inversion on the peritoneal surface.
- 5. Prognosis. The mortality in acute cases in recent years has been about 35 per cent; in chronic ones, about 6 per cent.
- 6. Treatment. In all acute and in most chronic cases, manual reposition should be tried In most of the former, if undertaken early, and in many of the latter, this procedure is successful. If it fails, repositors, etc. may be used, but only for a short time. If these are unsuccessful, one should resort at once to some operative method, the one of choice being colpohysterotomy. This operation stands pre-eminent in the treatment of

difficult cases of uterine inversion, on account of the facility of its performance and its success in accomplishing the reduction of the inversion, and also because of the practically complete absence of any mortality. The uterine incision should be made at first through the cervix only, and later be extended as far into the corpus as necessary to accomplish reposition. In inversion due to tumor, the treatment is mostly that of the causative fibroid After this is removed, if the uterus still remains, in about one third of the cases spontaneous replacement occurs, while in the other instances reduction is accomplished usually without difficulty by non-operative methods.

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THE PATHOLOGY OF UTERINE CASTS PASSED DURING MENSTRUATION

BY W BLAIR BELL, B S, M D, LIVERPOOL Gynecological Surgeon with Charge of Out Patients Royal Informary Liverpool

Y N January, 1912, I showed before the Gynecological Section of the Royal A Society of Medicine two somewhat unusual uterine casts passed during menstrual periods by a married woman aged 12 These specimens very much resembled abortions, both in their macroscopical and microscopical appearances; but as I had removed the patient's tubes some two years previously there was strong presumptive evidence against pregnancy.

I brought forward these specimens for the purpose of provoking a discussion on the pathology of menstrual casts, since there are many who still adhere to what I regard as an untenable view namely, that all endo metrial menstrual casts are the result of con The discussion 2 tended to empha size this point of view. I therefore showed a further series of specimens before the Society last July 1 The general opinion then expressed in the discussion coincided with mine namely, that while there is a decidua-like reaction, it cannot be mistaken for the true decidual reaction of pregnancy

I have thought it worth while, therefore, to publish an account of this further scries of specimens which I have obtained in the last six months I hope to prove, once and for all, that the idea that menstrual endometrial casts are all the products of conception is an entirely erroneous one, although of course abortions do occur and may sometimes be confused with menstrual casts by those who

are unaware of the histological differences In order to make the communication more or less complete, I propose to discuss all forms of menstrual casts. These may be

- 1 True blood casts of the uterus.
- 2. Endometrial casts.
 - (a) Thick casts,
- *Proc Roy Soc Al Feb 1912 p 153 Proc Roy Suc M Feb 1012 n 186 Proc Roy Sec 31 July 1017 p 371
- (b) Thin casts.

- I do not believe any other form of menstrual cast exists
- 1 True blood casts of the uterus. One or more of these may be passed during a menstrual period The specimens shown in Fig. 1 were all expelled at the same menstrual period, during which there was considerable bleeding The patient was a married woman about 45 years of age, and she had had menorrhagia for three months The pathology of this condition is not difficult to understand

As I have previously stated,4 and hope shortly to prove more fully, menstrual blood does not clot normally, because the fibringen and fibrin ferment are extracted by the endometrium When, however, the endometrium is unhealthy and fails to extract the ferment, or when the flow is so great that the blood passes through the endometrium too quickly for the extraction of the ferment to be effected, then in either case clotting of the menstrual blood may take place in the uterine cavity The expulsion of the clots leads to dysmenorrhœa, as I have pointed out elsewhere *

These blood casts of the utcrus are therefore merely retained clots which have been moulded into the shape of the uterine cavity. Histologically they are seen to consist of blood clot only (Fig 2)

2 Endometrial casts may be thick or thin, and they are usually passed in two separate portions.

(a) Thick casts. Such specimens (Γigs 3, a and 5) are not common, and they are certainly the most difficult to distinguish from abortions But I think that the histological appearances of these casts do not resemble those of the ordinary true decidual cast of pregnancy so much as is usually thought, The specimens were passed by a woman whose tubes I had previously removed. She expels them almost every month; and, as will be seen from the illustrations, they are some-April 1912

* The Principles of Gonecology 1919.



lig 1 (above) Menstruil blood casts of the uterus Fig 2 Section of Menstrual blood cast

what variable in macroscopical appearance. The membranes themselves are thick. If not rolled up they are smooth on the surface that has been detached from the uterine wall. Their thickness depends entirely on the fact that practically the whole thickness of the endometrium has been detached. The third specimen (Fig. 5) is very small and consists of rolled-up pieces of tissue. It have recently obtained a fourth cast from this patient, which is similar in macroscopic appearance to that shown in Fig. 4. The microscopical appearance, however, is the same in each case (Figs. 6, 7, 8 and 6).

There is a decidua-like change in the cells of the stroma and those lining the glands, but this decidua-like change differs from the decidual change of pregnancy chiefly in the size and shape of the cells Further, there is



I ig 3 (above) Thick menstrual endometrial cast from same patient as the one shown in Figs 4 and 5 Fig 6 Section of cast shown in Fig 8

marked effusion of blood scrum among the cells which gives rise to a ground glass appearance in the stroma This is not seen in the decidua of pregnancy (Fig 10)

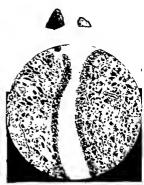
In all these menstrual membranes it is usual to find a certain amount of degeneration, which is proportionate to the length of time they have been retained before being passed and fixed in preservative fluid. Sometimes the degeneration or maceration is so advanced as to make histological investigation and photomicrography difficult.

(b) Thin cast: These casts are more readily admitted by many to be menstrual rather than conceptional in origin, although there are still those who believe that these membranes also are the result of pregnancy. Four specimens from two patients are illustrated (Figs. 11, 12, 13, and 14)

Both women were married The one from whom specimens shown in Figs 11 and 12



Fig 4 (above) Thick mensional endometrial cast from same patient as those shown in Figs 3 and 5 lig 7 Section of cast shown in Fig 4



I as 5 (abox e) Small thick mensional endometrial cast Feom same patient as those shown in Figs 3 and 4 Fig 3 Section of cast shown in Fig 5 Incidentally the folding of the membrane on itself to produce a solid cast is shown.

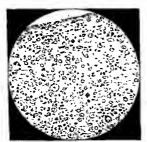


Fig o Section of fourth mensitual east from the patient from whom easts shown in Figs. 3, 4 and 5 were obtained

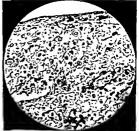
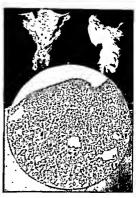


Fig. 10. True decidual cast (abortion) Compare with



Fig. 11 (also e) Thin mensional endometrial cast from same patient as that shown in Fig. 22 Fig. 15 Section of thin endomatrial cast shown in Fig. 11

were obtained commenced to pass them only after her second marriage The specimen shown in Fig 12 was obtained after a test separation, if the statement of the patient can be relied upon. The patient from whom specimens 13 and 14 were obtained was the wife of a doctor who has given me the fullest particulars of her case Knowing the common supposition with regard to pregnancy, he assures me that these membranes are passed subsequently to a test separation just as at Another interesting feature other times connected with this last case is the fact that the two sisters of the larly in question also pass similar membranes every menstrual period. They are both unmarried A breakage in the post robbed me of the opportunity of investigating membranes passed by the two sisters



I ig 12 (above) Thin mensitual endometrial east from same patient as I ig 11.

I ig 16 Section of thin endometrial east shown in Fig. 12.

Sections of these thin endometrial casts show in every instance that there has been a decidua-like change in the stroma cells (Figs 15, 16, 17 and 18). Of course when the membrane is as thin as some of these are, degeneration takes place very rapidly and the ilectidualities reaction is not always easy to photograph; but if careful histological evanimation of the sections be made, no doubt can be left in the mind of the observer as to the character of the change.

Cuthbert Lock ser's statement that in his experience "the cells in menstrual endometrial casts were small, shrunken and branching, the stroma was formed of a slender adenoid reticulum," I cannot in my opinion be accepted as representing the typical micro-copical appearance seen in these specimens. That description applies to the normal endometri-

Proc Roy Soc M Feb 1912 D 151



I. i. 13 (above) Moderately thin mensitual endometrial cast. From same pritent as that shown in Fig. 14.

I. ii. 17. Section of thin endometrial cast shown in Fig. 13.

um in the 'resting' stage of the menstrual cycle.

From the above description it will be seen that there are two forms of menstrual casts from the uterus. the 'blood cast' and the 'endomental cast' With regard to the differences in the thickness of the latter, I believe this to depend solely on the depth of the endometral denudation. The menstrual decidua-like reaction which, as already pointed out, can be seen in the sections, prevents the 'blood from breaking through easily, convequently the menstrual hæmor-



Fig. 14 (above) Moderately thin menstrual endomental cast. From same patient as that shown in Fig. 13.

Dig. 18. Section of thin endometrial cast shown in Fig. 14.

chage strips up the superficial portion of the endometrum instead of pasting through it. This may lead to a considerable portion of the endometrium being stripped off (thick membrane) or to denudation of the superficial layers only (thin membrane). Either type of membrane may become rolled up and form a so-called 'solid' endometrial cast (Figs. 5 and 8) when retained long enough in the uterine cavity

NOTES OF CASES ILLUSTRATING SOME OF THE SURGICAL ASPECTS OF PERSISTENT MECKEL'S DIVERTICULUM

WITH REMARKS AND A RECORD OF TWENTY-TWO CASES

BY HAMILTON DRUMMOND F R C S, (EDEN) NEWCASTLE-UPON-TYNE, DAGLAND Surrecal Reconstruct Royal Victoria Jefferson

N reviewing the surgical records of the Royal Victoria Infirmary from 1000 to May, 1912, I found no less than 22 cases of acute abdominal disease

resulting from a persistent Meckel's diverticulum. These cases are all of interest because they illustrate the majority of dangers for which this remnant of the omphalo-

mesenteric duct is responsible

At the pathological meeting of the Northern Division of the British Medical Association in the summer of 1910 I showed a series of Meckel's diverticula removed either by operation or obtained from the post-mortem room. and drew attention to different varieties and to the dangers which each particular type was likely to occasion

The accompanying table, though incomplete, shows that, speaking generally, a certain type of diverticulum is responsible. when harm arises from it, for a definite and specific lesion, e g, a Meckel's diverticulum of unusual length (6 or 8 inches) will cause intestinal obstruction, and may be inflamed or strangulated as the result of interference with its blood supply by a loop of implicated small intestine

Again, a diverticulum adherent to the umbilicus, by acting as a band, may cause strangulation of the small intestine or pro-

duce a secondary volvulus 1

Or, diverticula of the small cone-shaped variety may become inverted into the bowel and produce intussusception These have their broad base at their proximal end, and when examined in the recent state the mucous membrane at the base is usually found to be lax It has been shown that at an early stage this lax mucosa only may be prolapsed into the small intestine from which the diverticula springs, and that, acting like a

prolapsed pile, this in its turn may produce

hæmorrhage and pain Since recording six cases of inverted Meckel's diverticula which caused intussusception2 two more have occurred in the Royal Victoria Infirmary, Newcastle-upon-Tyne, making 7 per cent of all cases of intussusception admitted from 1900 to June, 1912. One of these, which came under the care of Mr. Turner, is of special interest since it illustrates the fact that frequent attacks of pain may occur before the diverticulum is completely inverted into the bowel and the accompanying intussusception is produced

The patient, a clerk aged 34, was admitted to the hospital on January 22, 1012, with a history that in August, tost, he began to have attacks of abdominal pain accompanied by loud rumblings and sometimes diarrhera, though no blood was ever found in his stools

In November, 1911, the attacks became more pronounced and he was obliged to take to bed for several weeks The attacks of pain recurred from time to time, and about a month before admission he vomited, and a neek before admission the vomit contained some altered blood, but there was no For three days before admission he vomited incessantly and complained of great pain coming on in spasms. The bowels acted regularly and there was a tendency to constipation

On admission he looked very ill and wasted pulse 128, temp Q8" The abdomen was distended but not markedly so, and no intestinal movements could be seen Rectal examination was negative An enterostomy was performed by Mr Turner, but no further exploration of the abdomen was made on account of his general condition. He died two days later from toxemia

On post-mortem examination an intussusception of the small intestine was found, the anex of which was formed by a Meckel's diverticulum about 3 inches in length distal end of the diverticulum was bulbous and gangrenous (Fig 2).



lig r A Meckel's diverticulum which contained a calculus. The distal end was bulbous and formed an abscess cavity. It was covered over by adherent omenium which prevented rupture of the abscess into the general peritoneal cavity (calculus natural size)

Although the pathological conditions resulting from a Meckel usually conform more or less accurately with one of the above types, there may be complications a fact which is illustrated by a case admitted into the Royal Victoria Infirmary under the care of Mr Martin in December, 1000

The patient had intestinal obstruction, complete gangerne of the terminal portion of the Meckel due to strangulation of its blood supply, and an abscess cavity surrounding the gangrenous perforated divertication in which a calculus was found

D II, male aged 77, whose history was as follows: Eight days before admission he was serzed with a sudden pain in the abdomen just below the unbilities whilst taking his midday meal. He was obliged to go to bed, and hot applications were applied to the abdomen but without reflex as the pain recurred in paroxysms about every twenty minutes. Two days later he vontted dark green, ble-stained material and the pain and somiting continued up to the time of admission.

When admitted his general combition was good, his tongue was moist and red, pube 86 temp 98.4° lle complained of parovi smal abdominal pain on inspection the lower abdomine was somewhat distended No perisaltite movements could be seen. On palpition a distinct mass could be felt below and to the left of the umbilicus tender on light pressure.

On December 17, 1909, Mr Martin explored the abdomen by a middle line incision below the umbrircus In abscess was found just to the left of the umbricus in contact with the anterior belly wall Coils of small bowel and a portion of the omentum surrounding it formed the abscess walls In the center of the abscess lay the distended distal end ol a Meckel's diverticulum, which was gangrenous and perforated, allowing the escape of a small calculus into the abscess cavity the surrounding loops of small intestine were greatly distended and obviously obstructed The abdomen was packed off, the Meckel's diverticulum was exposed, ligatured at its base, and excised, along with an adherent portion of great omentum, and the stump of the diverticulum was inverted into the intestine by a purse-string suture of eatgut.

A gauze drain was placed in the affected area and the abdomen was closed in layers by eatgut. The patient made an uninterrupted recovery and left the hospital well and healed on January 11, 1910.

Description of specimen (Fig. 1) The

Description of specimen (Fig. 1) The diverticulum was 4 inches in length. The distal end was distinctly bulbous, forming a cavity that would hold a pigeon's egg. The



Fig. 2. A Metkel's diverticulum which has become inverted into the bowel. It formed the apex of an introsusception of the small intestine, which has been reduced.

wall of this portion was surrounded by comentum except at the point of trupture (in the drawing this has been removed), where it was merely formed by the thin gangerous coat of the diverticulum. The proximal end communicated with the di-lad portion by a narrow channel 34 inch in diameter. The distal end of the diverticulum, in the ordinary state, contained a flat calculus \$\frac{5\chi^2}{2\chi^2}\$ (inches The surface of this was smooth, non-faceted, of firm lexture, and dark brown in color. It weighted 12 grains, and 1706, Bambridge, who kindly made an analysis, reported it to con-ist of in-pissated facal

matter containing bile nigment The differential diagnosis of the most common lesions produced by Mcckel's diverticculum viz. peritonitis and obstruction is difficult, because either condition may be produced by other causes the most common heing a distased vermiform appendix, and the pathology of these lesions whether occurring in connection with Meckel's diverticulum or appendix, is the same Both may suffer from allacks of inflammation varying in degree from catarrh to gangiene, and either may cause intestinal obstruction, though in the case of the appendix obstruction is nearly always due to a kink in a loop of small bowel entering into the formation of an appendicular abscess, and is consequently secondary to an inflammatory lesion primary in the appendix, whereas in the case of the Meckel's diverticulum obstruction is often the primary lesion and changes in the Meckel itself secondary (strangulation, in-

flammation gangrene)
An example of an appendix causing obstruction was admitted into the Royal Victoria Infirmary under Mr Clay in April, 1000

The pritient a boy aged to had acute intestinal obstruction. Using appendix had become weapped round a loop of small intestine causing strangulation of the bowd. The swelling of the distended loop interfered with the blood supply of the appendix so that the trip of it was quite gangreous.

But this train of events, as has aheady been stated is comparatively rare

The difficulty attending the differential diagnosis of acute abdominal lesions caused by Meckel's diverticula from those associated with the appendix vermiforms is plainly shown in cases 20 and 21 of this series.

The subject of case so was a male aged 55 who was admitted into the Royal Victoria Intimary on September 7 tori, under the care of Mr. Roch ardson. He was secued with pain in the right side of the abdomen with somiting 11 days before The symptoms subsided and he felt better until three days before almostion, when the pain returned in the lower part of the abdomen.

On admission he looked ill, temp 90° pulse 100 The abdomen was tender and rigid in the right that loss where there was an indefinite mass A

diagnoss of acute appendicitis was made

It the operation a small normal appendix, a
inches long was found \(^1\) small Meckel's diverticulum was also discovered, with its distal coil
affectent and gangrenous but not perforated. This
was removed and the patient went home well on

September 18 1011

The other sace No 21, is also of interest A toung man aged 10 was admitted into the Royal actional interaction and the control interaction and the cont

On admission
On admission his pulse was 132 thin and thready,
and he looked very ill. The abdomen was distended
and there was no flank dullness. The inverdullness usageres no.

Mr Licch who was him operated and found a Meckel's distriction in a inchis in Earth. The terminal end was bound down in the pelvis, and a band which extended from the bulbous end of the Meckel to the ideas a date in the state of acute in the many and the state of acute in the many and the state of the state of acute in the state of the state

Many cases of acute Meckelitis operated upon for appendicutis have been recorded, to a few of which I may briefly refer

Sharrier reports a case of his own occurring in a man agait 85, who for two and a half years hall sof feered from attacks of pun in the right iliae region. A diagnoss of apprandists was maile and right operation a mass was fell containing calcult, which was thought to be gail blaider but which torned which in the occur state measured 45 inches in length, and presented at a point about it nich from

* Repail Society of Medicine New 1909

the proximal end a definite constriction, formed by a fold of mucous membrane Beyond this point the diverticulum contained many small black calculi composed of cholesterin, calcum oxalate, and a trace of hile pigments. It was removed, and two years later the patient was well

and free from attacks of pain. It was thought that these calculi were formed in the diverticulum as the result of inflammation of its mucous membrane, and the fact that the neck of the diverticulum was too small to admit the passage of the greater number of the calculi confirms this view.

Hollander reported a case of a man operated upon ten hours after the onset of an attack of abdominal pain that was supposed to be due to appendicitis. The operation, however, revealed a gangrenous Meckel's diverticulum full of calculi which were thought to be gall stones. The diverticulum was removed and recovery followed.

Oliver Smith,3 in a paper dealing with abdominal crises caused by Meckel's diverticulum, records two cases of his own, in one of which appendicitis was diagnosed and a gangrenous Meckel found at operation.

Todd,3 writing on the same subject, states that in his experience a Meckel is frequently the cause of abdominal lesions, and that it may give rise to all the urgent symptoms of acute appendicitis. He remarks: "We are all familiar with cases of recurrent abdominal pain, with distention and tenderness, which have been diagnosed as relapsing appendicitis. Our diagnosis has not perhaps been made as certainly as we could wish. In spite of the acuteness of the pain and the urgency of the symptoms, the pufse is often hardly quickened at afl and, more disconcerting still, the temperature does not rise. At the operation the appendix is found normal, or almost normal, but to remove it is a safe thing to do. and the hope is expressed that the cause of the disturbance is removed, not infrequently, though, the pains recur as before the cfass of case in which I think very often the diverticulum is in one of the ways I will presently mention the cause of the symptoms "

Along with cases of his own he records particulars of one of some interest that occurred in the practice of a colleague.

The patient, a hoy aged 10, had an acute abdomi-nal attack. The pain was most marked in the appendix region. The appendix, which was not obviously diseased, was removed. On the day following the operation he was worse. The abdomen was again opened and a long Meckel's diverticulum, the vessels of the mesentery of which were thrombosed, was found knotted round a large coil of ileum In this case no doubt obstruction occurred first and later gangrene of the Meckel, due to the increasing congestion of the loop of small intestine mvolved

He also records two similar cases which occurred in his own practice.

There are many cases of inversion of the appendix into the cæcum on record, and, as we know, some of these have been responsible for an intussusception of the cocum.

Both diverticula and appendices may contain calculi. As stercoliths they are more frequently met with in the latter, but they are capable of giving rise to similar symptoms and of producing the same pathology. The poor blood supply of a Meckel's diverticulum probably renders it more liable to gangrene than the more richly supplied vermiform appendix, and it is quite common to meet with Meckel's diverticula in which the distal end is bulbous, thin-walled, and without the good vascular supply which the remaining portion often possesses.

Sometimes an abdominal lesion due to Meckel's diverticulum is suggested by the discovery of some abnormality at the umbilicus. Treves' states, for example, that a congenital hernia is not infrequently present. and other abnormalities of the umbilious are recorded, from a mere tucking in to definite fistula.

Bidwells operated upon a case of intussusception of the ileum due to an inverted Meckel's diverticulum in a boy aged three on whom he had previously operated for a congenital hernia at the age of one year.

Grays operated upon a case of intussusception of the ileum due to an inverted Meckel's

Quoted by Sherren Royal Society of Medicine, Nov., 2909 Asn Surg , Phila , Nov . 1904

Australasian Med. Gaz . Dec 20 to11

System of Surgery, vol. il. Page 727. * Lancet, Sept., 2907 Ann Surg . Phila., Dec., root.

F	Levin causel by Meckel	See	Age	Partice	Pre-yous ettack	Operation	Result	Type of dicertavium	Emilia el
•	Intestinal olatructura	Male	7	tays	No note	Enterwiony	Deth	No note	No note
•	Inverses of Meckel eaguing introduception of small bows	Walt	25	23,1	Previous at- tacks for sev- emi mouths	Reaction of intestrate Model	Recov	4 Hiches in length	3 + hote
3	Inversing of Meckel gaucing intursusception of ileum	Viale	,	tay	Nonois	Reduction of intercor, remodel of Market	Recov	Cone chaped Market broadened at base 1 Ji such in length	2-a note
•	Strongulei wit of gmell intestine	Vicie	& Salt	taye	No pare	Resection of gan arrange gut melu ling Merkela diverticu lum aparlomeas	fleeth	Alberent at its apec to the umbilious	No soct
3	Acute intestinal obstruction of ilcum goil perforction of Mckel causing septic jet Itonitis	Wale	4	5 tays	\u sote	\m_1	Death	No note	
٥	Acute inicitinal observation of sleam from a literaria around a trecket obschipties (was completely obstructed and augrenous	Male	٠	i j	No gota	Removal of gan grenous Verkel and adherunts relieved	Death	hmall necrow Meckel a inches in leasth a l berenj at il cajes	
'	Inverses of Meckel caucage talusqueeption of small lower	Hale	**	îaye	\u aote	Reserve of inter- spections sociolize Mockel	flacth	hmall concessared Meckel 6 H un bes m length with broad base	Marked to live Fig. of gentural exaltia
8	trute intestmal obstruction of loop of deum the Meckel acting as a loan (Male	13	lays	Attacks of pain an I vomiting coming on every 6 months for 8 years	Removal of Meckel s Investigation	Lo pode, Douth	Meckel # mehes in length and tapered in a roof at ite distal end which sibered to umbilitue	\a note
۰	Meckel hoped neer email gut causing obstruction Meckel tisell was completely gan grenous	Male	10	e la	\uer	Removed of Market e diversa slum	Death		\0 mote
10	Merkel became obstructed gangemout and perforated firming an abscess time analysis rakulur introjunal obstruction	Male	17	A leye	, mil	Removal of Meckel and raicult dramage of all ness	Recov	5 inches jung to recent lists narrow jung imal and	No Ente
"	Mechal postucing acute inten- linal obstruction of small boxed	Male .	et	∖ c fola	*cox2	Enterextomy and ex- moval of Meckelic dicetta-slum	Death	No mode	Su pote
.,	htrangulei in of the small interime over a Meckel all hereat to libe umi dieue	Viste	"	leys	Note	Remonal of Meckel	(Jarath	6 laci es jone and at to hed to the umbili cue	Sonite
13	Distal generalty of Meckel gengrenous hel supured also geted sea ban I causing intesting obstruction	Vicle	jt	ies	No mota	Remonal of Meckel enterosterny	Death J days	Net developed Metacl onth thin bottom extrem to which our periodice	No mote
14	Acute intestinal obstruction	Male	8	Lne	Vone	Resectant of small gut and Meckel appears contoury and to east anactomosta of anail bowel	Recov	\ > note	No mote
ts	Interesception of smell gut due to inversion of Meckel's directiculum	t emale	,	lase	Several first noticed or months preciously	Removal of Mecket	theath.	Cone shered 13(inches in length con tained an accessory pancress	Cer indra•
16	Steengulation of loop of emell intestine around a Meckel which was albecent et um bitieus		te	day.	\	Revertion of keep and Vircket and end to end anesternour	neat dev	a inches in length an I adherent to the unch I Kue	Sin icei um blaue
"	Inversion of Meckel producing intussusception of smell bowel	Mele	20	Lyn	'cvrral	Reserting of loop of small bostel contain- ing Meckel	Death	31% inches in length mucous mem? rene el hase very lex chab- abaped distal ce- lectury	Large and protuberant

6	6	1

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No. of Case	Lesion caused by Meckel	Sex	Age	Paration of Litack	Previous attack	Operation	Result	Type of diverticulum	Umbilica escatrix
18	Meckel producing obstruction of small intestme	Male	29	days	None	(2) Enterostomy (2) Resertion of small gut containing Meckel	Recov- ery	Small cone-shaped, adherent to the mes entery of the small bowel	Considerably indrawo
19	Inversion of Meckel's diver ticulum causing intussuscep- tion of small bowel	Male	8	u.k	No note	Laparotomy, resection of loop of bowel containing Meckel	Death	Small bulbous diver ticulum 2 inches in length	Normal
20	Gangrene of Meckel's diver	Male	55	day	No note	Laparotomy, removal of aleckel and dram- age of belly cavity	Recov	Small Meckel 2 mches in length	No note
21	Loop of small intestine other sent to old inflamed Meckel in pelvis causing acute in testinal obstruction	Male	19	day	Pain in appear dix region for 6 years. When removed con- tained thread worms	Removal of Meckel and adjacent loop of small intestine		4 inches in length well developed the terminal end was thin and bulbous	No note
22	Inversion of Meckel's diver- ticulum causing intussuscep- tion of small bowel	Male	34	mos	Attacks ex tending over 6 months before final attack	Laterostomy	Death	3 inches in length, gangtenous reduction impossible owing to inversion being of old	Normal

diverticulum. He observed the umbilicus to be raised and dome-shaped and the over-bying skin to be of a bluish tint and considerably scarred A somewhat similar conditionwas met with in cases ro and 17 of the appended series The umbilical cicatrices were large and dome-shaped, but discoloration and scarring were absent. In Case 14 there was pronounced puckering of the umbilicus, and this was also noticed in Case 6, but the sign was not observed until after death

The lesions produced by Meckel's diverticulum may be considered under three headings:

r. Different forms of intestinal obstruction and strangulation caused by its action as a band, or by some acquired change in its position and the formation of a loop, or acting as a pedicle in the development of a volvulus; and the production of an intussusception of the small intestine.

 Inflammatory lesions, with the resulting changes ranging from a catarrhal condition of the mucosa to complete gangrene of all the coats.

3. Some unusual forms, e g., when a diverticulum, closed at both ends, forms an enterocyst, or the presence of calculi gives rise to attacks of pain like appendicular colic, gallstones, hernia, etc.

The accompanying table shows that, of the 22 recorded cases, intestinal obstruction due alone to acquired adhesions occurred in 6 instances, in 2 there was strangulation of the small gut over a Meckel's diverticulum which was adherent to the umbilicus; in 7, intestinal obstruction resulted from inversion of the diverticulum, producing intussusception of the small bowel, and in another the diverticulum remained attached to the umbilicus, causing a secondary volvulus of the lower ileum, cacum and ascending colon. In the remaining 6 cases there was evidence of inflammatory changes in the diverticulum Three of them had perforated and caused peritonitis, and those remaining showed gangeres without perforation.

Of the 3 cases in which gangrene had occurred with perforation, 2 were associated with intestinal obstruction, which was the primary factor leading to arrest in the circulation of the diverticulum; while in the third, acute inflammation alone was present.

A primary acute diverticulitis is a rare occurrence. a case is recorded by Gray! in which neither torsion of the diverticulum nor intestinal obstruction was present.

In Case 15 there was a healed sinus at the

unbilicus, which had previously discharged. On the other hand, I may mention that I have frequently found the umbilicus raised or indrawn in subjects dead from other causes, where no Mcckel's diverticulum was present. But with symptoms of an acute abdominal attack, this sign may be held to

But M I 1002

be suggestive of the diagnosis of a Meckel's diverticulum, though it cannot be regarded as conclusive.

CONCLUSIONS

- 1. A persistent Meekel is a decided source of danger
- The definite lesion resulting from it is largely determined by its anatomical form;
 g, small Meckels with broad bases are most likely to cause intussusception.
- 3 Owing to the rarity of Meckel's divertieulum (2 per cent in bodies examined), acute

inflammatory lesions resulting from it are necessarily uncommon.

- 4. The symptoms may be precisely similar to those that arise in connection with lesions of gall bladder, intestine or appendix. The pathology is practically the same, and the diagnosis may be impossible. The appendix is most commonly mistaken.
- 5 Changes at the umbilicus may aid in the diagnosis of a diseased Meckel.
- I wish to thank the surgeons on the staff of the Royal Victoria Infirmary for allowing me to make use of their cases.

ACUTE DILATATION OF THE STOMACH AND ITS TREATMENT

By O J. BORCHGREVINK, M D. CHRISTIANIA, NORWAY Surrout at Dalonhiemed

T the November meeting of the Christiania Surgical Society in 1907, a naper was read on the post-operative acute dilatation of the stomach. whereupon a lively discussion ensued reading through the report of the meeting one will notice that that side of the subject which aroused especial interest was the etiological, or in other words the purely scientific, question as to the still obscure origin of the disease. The practical side, the treatment, was, comparatively, only superficially referred to The repeated use of the stomach tube was recommended, also rectal feeding, saline enemata or hypodermoclysis All were agreed as to the early and repeated use of the stomach tube, both as a diagnostic remedy and as the most important therapeutic agent. That even this, however, is too often without avail was proved by the fact that of four mentioned cases of acute post-operative dilatation of the stomach treated in this way, two ended fatally. Several speakers implied, however, that they had seen lighter and quickly transient instances of this illness

My experiences later aroused my interest in the acute dilatation of the stomach. It struck me as strange that a remedy suggested by Schnitzler—according to testimony an

extremely efficacious one -- to let the patient he prone in bed, was not mentioned during the discussion in our surgical society. Half en passant, the lecturer said, It is true, that knee-chest position had been tried during the after treatment, on account of the hypothesis that arterio-mesentene compression may be the cause of an acute dilatation Likewise, Kelling's suggestion to place the patient on his left side with elevated pelvis was mentioned But Schnitzler's methodical procedure as the principal or only treatment was not brought forward A closer acquaintance with the literature has taught me that this topic, when discussed, generally has been treated in the same manner as with us - the etiology has engaged the interest to the exclusion of the treatment

With an illness so fatal as the acute dilatation of the stomach, contributions to the treatment can claim abundant space. An addition to the hitherto few examples of the effect of postural treatment seems specially to powess a considerable and dual interest. In the first place, it is of importance, on account of the treatment itself, to prove this effect, which is still denied by many Secondly, the effect of the abdominal posture once proved beyond doubt, a new light is thrown on the obscure etiology of the acute dilatation of the stomach. In this paper it is my object, primarily, to illustrate by my own cases the effect of the abdominal position in acute gastric dilatation. Secondly, I shall try, by a collection of the cases which bave been published since the abdominal posture's first use in 1895, to put the different ways of treatment to the test. Finally, I use the striking effect of the prone position and the chief clinical characteristics of the acute gastric dilatation as arguments in the discussion of the etiological question. I have added two cases which were not treated with abdominal posture; this was done to publish known cases of this disease.

CASE 1. A. S. a widow aged 53, was admitted to Diakonhjemmet February 22, 1910, with a diagnosis of chronic appendicitis, discharged April 13. Family history good. Her present illness dates back two years. It commenced suddenly with an attack of pain in the abdomen, accompanied by vomiting and a soreness helow the right costal margin got up again after three days, but felt unwell, was without appetite, and with any movement the pain revived in the affected part This condition changed two days later quite as suddenly as her illness usually commenced, with a more violent attack than she previously had had The pains had their seat in the whole of the abdomen, but perhaps most acute in the epigastrium, and were first alleviated, after 24 hours' duration, by an injection of morphia. An attack of pneumonia now kept her in hed for 16 days August, 1908, and during the last three weeks, she had had similar but somewhat slighter attacks, with two to three days in bed. Taundice has never been noticed.

Present conduiton. The patient is a well-preserved, fairly stout woman, somewhat pale but with no appearance of an invalid, Kidneys and thoracce organs sound. Abdomen large but soft. Liver not enlarged, gall-bladder not palpable. Patient is tender below the right costal margin and in the caccil region. T, vesp. 36 44, P. 02.

Operation Appendectomy and cholecystectomy were performed under acopolamin-morphin-ether. The appendix, which hote traces of an old pathological process, was removed. Thereupon the gall-bladder was excised. It was firmly connected with the duodenum and full of stones right up to the proximal end of the cystic duct.

One hour before the speration the patient was given subcutaneously ½ mgr scopolanun, and 40 minutes later 1 cgr, morphia and 1 ccm oleum camphoratum. The narcosis tool, place through open gauge mask; patient became unconscious after 11 minutes, with a consumption of 30 ccm. ether. The narcosis lasted 2½ hours, was easy and without

complications of any kind, and was not followed by sickness, 240 ccm. other were used

Feb. 27.—T. 37, 37.1; P. 100. Patient feels well, has slept fairly well. Appearance good. No vomiting since the operation. Allowed to drink water gruel and water. The urine has to be taken by catheter.

Feb. 28.—T. 36.9, 36.7; P. 92. Condition and appearance good. Flatus has heen passed since yesterday morning. Patient has drunk about 100 ccm. water gruel in the last 24 hours, and on account of thirst a large amount of water, much more than usually permitted. Vesterday aftersoon, without preceding indisposition, she vomited twice with half an hour's mireval, at thir preceds this without of the control of the property of the p

March 1 — T. 37.2, 36 8, P. 92. Patient still feels well, she drank 200 ccm water gruel and a little water in the last 24 hours, without vomiting. Extreme thlest Saline enemata 4 to 6 times daily.

March 2 — T. 37.1, 36 9, P. 96. During the last 24 hours she has drunk the same amount of gruel and water as hefore. She complained yesterday afternoon of heaviness and fullness in the chest, also a latter taste. Four or five times in the chest, also a latter taste. Four or five times in the course of the night she vomited small quantities of fluid aimidar to that of the day after the operation. She complains still of oppression and an intolerable thirst. During the morning vialt partly through an introduced stomach tibe and partly by owniting, about 1½ litres of thin, greenish fluid, which now has a nauseating odor, was emptied. The patient afterwards felt much better and easier, but excessively thristy. Salme enemat are continued.

March 3 — 36 o, 36 t. P. rod . In the last 22 hours she drank only 50 ccm water gruel and very little water. During the evening vast yesterday, one hree was evenauted by the stomach tube. Not-withstanding the abundant supply of field through the return, her thirst is overshelming. Indius has been passed since the day after the operation, been passed since the day after the operation. Vesterday morning shoult 14 little of thin, greening fluid was emptied by the stomach tube, it gave his exection.

At the evening visit the patient's condition is the same. The appearance is still fairly satisfactory, but she complains of fullness and unquenchable thirst, worse than ever. The abdomen has during the whole time been distended, mostly ahove the navel, but the distended mostly ahove the navel, but the distended no most patients to 8 to 10 cm. below the unhilitious, chiefly in the left side.

During the last two days I had not for a moment doubted that the case before me was one of post-operative gastric dilatation. This supposition was strengthened by the excessive thirst, absence of peritonitis, and intestinal obstruction, and further by the fact that despite the regular evacuations by the tube the stomach not only had remained distended but during the last 24 hours evidently had increased in size.

As a guide to treatment, my first thought had been the discussion in our surgical society. which I read over, but the modes of treatment mentioned there were evidently not fully efficient. The objection might be made that my patient was continually allowed to drink, but her thirst was so extreme that it seemed altogether inhuman to prevent her from so doing. Under these circumstances I was obliged to seek other sources of information in the literature at hand. I sought for some time in vain, but ultimately in Moynihan 1 I found the following. "In my own few cases, relief has always been given by changing the position of the patient. He must be placed prone in hed" I was soon to have use for my newly acquired knowledge

March 4 — T 36 3, 36, P 116 The patient's appearance has since yesterday evening undergone a striking change. Her face is bollow, and its expression mett. Death seems near. Her pulse, which the whole time has been unalterably full, is now nearly thready, and the patient herself whispers that she has not many moments left.

During the last 24 hours she has drunk 500 cm water and gruel and received 6 rectal enemata, but her thirst is the same. The distention of the stomach has further increased. With a stomach tube we emptted 15 littles of fluid of the same appearance as before, but with a more unpleasant odor. The tubing brought little or no relief.

At 12 o'clock midday we laid the patient on her chest, with a pillow under the peless and one under her shoulders and throat, which induced the exclama-

tion, "Oh, that was nice!"

From the moment she came in that position, her condition has changed. Womiting has ceased altogether, and all feeling of fullness and pain in her abdomen is swept away. She declares she has become another person, and the change in her appearance in the course of hall an hour is a perceptible corroboration of the fact.

10 Month and T. 20 J., 10 S. P. 116 The patient has his poon in both earthy the whole of the time state yesterday midday. Now and then, for a moment's change, she had han on the right sade, but perfers to lie on the abdomen. She says she feels well, her appearance is good, and her face has resumed its former plumpness. Since yesterday midday she has taken doo cen water gruel, 1½ litres milk, four eggs, and a little water now and then, all without the slightest monvemence. Uthough she has

s Abdominal Operations ' and ed p \$5

hesides received four saline enemata, she is still thirsty. "It is nice to get plenty to eat and drink now," were her first words this morning

At the range with the same and we have dead to a dead the same and the course of the same and th

March 7 — T 36 9, 36 9, P 96 Patient still lies prone in bed and has slept comfortably in that position. She looks and feels well, but is still thirsty.

She is now placed on her back

March 5 — T 36 5, 36 5, P 100 Has in the last 24 hours lain mostly on her back, and drunk more than the day before Feels extremely well, and is allowed solid food

Her further progress presented no complications According to report of May 15, 1012, the patient has

been and is quite well

Caste 2 Gunda P. martned, aged 27, entered Diakonhemmet August 7, 1910, discharged August 30 Patient's family history good, always been well herself Menstruation in order from 15th year the fornight ago, when it failed to appear. Patient has had no children or abortus and has never been troubled with indigestion

While dressing this morning the patient was suddenly attacked by violent pains in the lower regions of the abdomen. After a while she felt better but with new movement came an even more severe attack, so that she nearly fainted. She could hardly reach the sofe where her husband found her, white as death and half unconscious. A doctor was called in and sent her to our hospital.

Status — The patient is in extreme anamia, all mucous membranes bloodless P of, T 363 Lungs and heart are in normal condition. Abdomen shightly distended and extremely tender over the pubes, where there is a dull zone of 8 to 10 cm. Urine

Exploration reveals a soft tumor behind the uterus most prominent in the middle line. The uterus is displaced upward and forward, lying close helund the pubic arch. After exploration a new attack of pain ensued, wherefore we at once prepared to operate.

Operation Salpungotomia dextra was performed at 1 a c'olcho Loon Upon opening the abdomen a quantity of blood, partly fluid and partly clotted, was seen to occupy the lone part. The source of the harmorrhage was the right tube, which formed a valunt-stated tumor, the top wall of significant and exceed, the blood scooped out, and the abdomnal cavity cleaned as well as possible.

Twenty minutes before the narcosis, 1 cgr morphia was given subcutaneously The — anathelization—on open gauze mask — commenced at 12.10. Unconsciousness supervened 10 minutes later, after 55 ccm. of ether. The whole amount of ether used was 170 ccm. The narcosis was easy and without complications of any kind.

Aug 8—T. 50, 37.3, P. 80 Tongue clean, humd Vesterday afternoon, in connection with the operation, patient vomited lour times. After 1cgr. morphis aboutaneously she slept larly well No suckness in the night. To-day whate as death longuid, with widely dilated pupels. Addomen hollow, soft, and not tender. Patient is very thirsty. She has been give in milk and water by teaspoonfuls, but she has, it is stated, on account of the learful thirst, drugh, much more than permitted

Aug. 9.— T. 53, a. 37.2; F. toS. Later in the morning the patient began to vonili and complains of violent pain in the epigastrium. In the course of the day, she has vomited 8 times — a thin graybrown fluid with no odor. At the evening visit she still complains of severe pain. She has been given regr morphia and ingesta of any land is lorbidden. Vomiting has continued part of the night, however, sometimes without anything coming up. To-day there is some distention and tendenres in the epigastrium and the whole of the parts above the tender to dathended. With the stomach usle 15 little gray-green fluid was evacuated. The patient is still forbidden to eat of raths.

At 8 P.M. datus has been passed since the middle of the day, 48 hours after the operation. Although the patient has not drunk anything, yomining sincesas, the voim to-day being greener and containing bile. Pain unchanged, also thirst. The abdomen is more distended in its upper and left part, and by percussion splashing sounds are heard. The patient elses very ill, and declines absolutely to have a stomach tube introduced. She is laid from the distribution of pillow under the chest out different and one carest of pillow under the chest out different days.

the grown.

Adg 10 — T. 38 2, 37 1. P. 100 The patient sleept well during the might She lay yesterds verning first for ½ hour on the abdomen, then the same length of time half on the abdomen and hall on the right side. She sleept lying on her lelt side, and sleep the whole night, from the same moment half on the right side has yes one more than the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the same moment of the property of the pr

When she woke this morning, she lay of her own accord on the abdomen, and drank an aleglassful of barley gruel and half a glass of milk without any unpleasantness before the morning visit Her appearance is totally changed. She is smiling and pleased

Aug. 11 — T. 38, 37 a, P. 84. The patient is pale, but her appearance further improved Vesterday morning she draink plenty of milk without inconvenience. She lay yesterday nearly the whole time on the abdomen, much more than was required of her, as she was quite convinced that it was that, which had relieved her of the pain and vomiting. For dinner she ate some fish and milk sony, for sup-

per, porridge and milk, all with satisfaction. In the middle of the might she woke and turned over on her back, and slept thus until the morning. She ate breakfast to-day with a good appetite. The abdomen is now more distended than before, but the distention is even. There is no tenderness.

Aug 12 - T. 37, 37 3, P 80 Perfectly well. Eats and drinks as if nothing had occurred.

The patient was discharged August 30, in excellent condition, and informs me, May 10, 1912, that she has been quite well ever since

Case 3 P. A, aged 43, male, was admitted to Diakonhjemmet August 26, died September 20.

His illness began three years ago with an attack of three weeks' duration. He had abdominal pain several times a day, with eructation of acid fluid followed by one or more vomitings I le also vomited regularly directly after meals When the attack was over he felt comparatively well, only feeling slight pain now and then, sometimes accompanied by eructations, but he was always able to do his work, He was taken ill again a fortnight ago with epigastric pain radiating backward. The pain began suddenly from 1/4 to 1 hour after meals and lasted for about an hour, not appearing unless food was taken, During this last attack the patient had no eructation or vomiting. In the course of the last month he has noticed a rapidly increasing swelling of the scrotum

On admission he complained of such violent pain in the left hypochondrac region and hack that he could not he down. The abdomen was moderately dissended, there was exquisite tenderness below the left costal margin, and on the right side some nightly. The night margin of a flat, immovable tumor is felt on the posterior abdominal wall a little above the navel. On physical examination, heart and lungs were found normal. Urine ap. gr. not 5, no albumen, no sugar. The left testical forms a firm, even, and not tender tumor, the size of a closed band.

Operation Sept. 4. Pericolitic adhesions of the common type were found on the ascending colon and the hepatic flexure. The upper part of the ascending colon was compressed and its lower part, with the execum, decidedly distincted. The adhesion of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the spine and the control of

Ether nercosis: 25 minutes before the anæsthetization, 1 5 cg morphin was given subcutaneously. Narcosis supervened after 13 minutes, requiring 55 ccm. ether, it lasted for 57 minutes, the operation, 40 Total consumption of ether, 165 ccm. The narcosis was easy and without complications.

Sept. 5 - T. 36.7, 36 6; P. 80 The patient has home the operation well. General condition very good. No vomiting since the operation, and 18 hours later flatus was passed. I luid was allowed ad lıbitum.

Sept. 6 .- T. 36 7, 36, P. 108. No comiting until last night at o. The patient has since vomited four times, and altogether 2 litres of thin, greenish and odorless fluid. He complains of fullness in the epigastrium, moderate pain, and severe thirst. His aspect is unaltered. By stomach tube 800 ccm. greenish brown fluid were evacuated. Food and drink forbidden. Proctoclysis.

Sept 7 .- T. 16 8, 36.5. P. 124, and scarcely perceptible. After the gastric lavage vesterday morning the nationt felt relieved and the vomiting ceased for 8 hours; it then reappeared and gradually mcreased in frequency. During the last few bours there has been an interval of only 5 to 10 minutes between the vomitings, but during the night not more than about 100 ccm bave been vomited. The patient complains of abdominal distention and moderate pain; thirst worse than ever. His aspect and general condition have undergone a striking change since yesterday. His face is livid and pinched, his eyes bollow, and nose and extremities cold. The upper part of the abdomen is moderately distended, and by percussion and shaking splashing sounds are elected, and show that the greater curvature in the left side lies three fingers' breadth

below the umbilious By the stomach tube, directly after a comiting, 900 ccm. thin, black fluid were evacuated, which contains blood but gives an indistinct bile reaction. As the diagnosis, scute gastric dilatation, seemed certain, the patient at g A. M. was placed prone in bed. It was difficult to find a position that did not cause pain in the abdominal wound, but at last we Absolute diet and proctoelysis were

succeeded

continued Sept. 8 - T 36 3, 36 6, P 100, fairly good Since yesterday morning the patient has been prone. for a change he has lain on the right side only for its minutes every other hour Since he was turned over on the abdomen be has felt quite well, all nausea and vomiting have disappeared, and his aspect is completely changed. His face has regained its

natural expression and lullness Last night and this morning a stomach tube was introduced, and by aspiration 20 ccm black, to-day 130 ccm greenish, fluid were evacuated Abdominal posture and proctoclysis were continued.

Sept 9.- T. 36 6, 36 2, P 96 Last night, through the stomach tube, 20 ccm light green, and this morning 15 ccm. greenish, fluid were aspirated General condition good, although the patient has slept little on account of the discomfort from the abdominal wound caused by the prone posture The stomach is not distended, and no splashing sound has been elicited since the postural treatment began Fluids allowed in restricted quantity

Sept. ro .- T. 36 8, 36 1, P 96 The patient last night lay semi prone on the right side and slept fairly well. He enjoys his fluid nourishment. On the whole, no sickness or vomiting have occurred during the last three days. Solid food and ordinary posture are allowed.

Sept. 22 - Uninterrupted satisfactory reconvalescence without gastric symptoms till last night The patient then, after a chill, had pain in the right side of the chest and began to cough The formerly normal temperature rose to 38.5. To-day, examination reveals a pneumonia of the inferior lobe of the right lung

Sept. 20 .- The patient gradually lost strength, and died on the seventh day of the pneumonia. Post-mortem The stomach was found normal,

with the exception of two small ulcers at the lesser curvature. The tumor of the testicle proved to be a sarcoma, and the retroperatoneal tumor in the upper part of the abdominal cavity a metastasis to the prevertebral connective tissue.

The two following cases, which are of much interest and have not been published before. were kindly submitted by Dr. P. Bull.

Case 4. N. H., boy o years old. From his earliest years be bas had "a sensitive stomach" He felt oppressed sometimes, and had pains under bis chest after meals January 31, 1972, be had a severe attack of appendicitis On February 4, appendectomy was performed in his bome under etber-chloroform narcosis, and a pelvic abscess incised and drained

Feb. 5 .- Since the operation the patient has been restless and bas frequently vomited a black fluid.

38 6, P 140 Fcb q-T 368, P. 88 Patient bas become better little by little, and his condition has been fairly satisfactory during the last few days. To-day facal matter is seen to escape through the wound

Feb 15 - The patient has been moved from his home in the country to "Red Cross Chnic," Christiama His appearance and appetite are improved The wound is wholly open, in its upper median part the lesser bowel is slightly protruding, and on its surface two small perforations are visible, which discharge thin yellow faces, while only now and

then slight flatus has been passed through the anus. Feb 17 - After an enema yesterday a moderate quantity of fixeal material was evacuated. To day, spontaneous movement of the bowels. Appetite

satisfactory

Feb 23 - During the last two days all discharge from the intestinal batulæ has ceased. In the night at 2 30, the boy had a severe attack of pain in the middle of the abdomen and has since lain in unceas-This morning he vomited four times ing misery and twice had normal rebel of the howels. The abdomen is not distended but is somewhat tender. No fever, pulse 84, good.

Feh 24 .- No fever, P. 80. Since yesterday one thin greenish vomiting Flatus passed Patient complains of pain in left side of abdomen, where he is tender The rectal wall is somewhat prominent and tender to the left. Under chloroform, a pararectal abscess is incised and a tablespoonful of thin pus is emptied from a cavity the size of a walnut, which is then drained.

This evening, since awakening from the narcosis, the patient still less and screams with pairs in the abdomen. Has twice vomitted a small quantity of thin greenish fluid. Pulse oo. No flatus and no discharge from the fistulus. The abdomen is tender, attill only slightly distended, and with no noticeable still only slightly distended, and with no noticeable sounds. The patient is much too restless for any thought of stomach tube.

Dr. Bull concluded that there existed a high intestinal obstruction, and at 7:30 in the evening a laparotomy was performed under chlorolorm, 12 cm median incision with the navel as a center

No fluid in the abdominal cavity. The small intestine was found in two places to be adherent to the short omentum and to the abdominal wall, from which it was easily separated. Directly above both adhesions the intestine is a little, but very little distended; but the greater part of the intestinal portion lying between both adhesions is collapsed The same is the case with the whole of the small intestine below the lower, and the greater part of the small intestine above the topmost adhesion, right up to the duodeno jejunal plica Near this is found a transversal, strongly distended, gray red intestine, which proves to be the horizontal part of the duodenum. Its dilatation ends suddenly at the point where the mesenteric artery, tightly strained, runs in front of the duodenum.

The reason for the compression of the duodenum by the mesentern vessels cannot be deaded. There are no loops of the small intestine in the pelvis, this is that of if from the abdominal cavity by the adherent S romanum and its mesongmondeum. The adherent is esser bowed does not seem to have exercised any traction on the mesentenum, nor does the perforated loop, which helongs to the lower part of the ileum, exert tension in any direction. The distention of the duodenum is unmastakable at any rate, and the only thing of consequence discovered by the operation.

The stomach is globular in shape and somewhat distended, but the greater curvature lies 3 to 4 fingers' breadth above the navel.

The wound was closed without anything being done to the duodenum or the strained transverse mesocolon. The operation lasted about an hour Directly afterwards, a subcutaneous saline infusion

of r litre was given.

Feb. 25 — No fever, P 50. The patient has been restless during the night, and screamed as before. He has womited four times. In consequence of the discovery made at operation, the patient is laid prone in his bed. The very moment the was placed thus he said, "That is nice". He is allowed to drink

water.
Feb. 26.— T. 37.4, 36 5; P. 120, 90. The patient slept on his abdomen 4 hours during the night, and was quiet. Vomiting and the earlier screams and

intractability have all ceased since he was placed on his chest. Likewise, the discharge through the intestmal fistula, which since February 2r had enturely ceased, has now recommenced General condition better. Continues to lie on the abdomen and feels well thus.

feels well thus.
Feh. 27.—Without fevet; P. 90, 84. The patient is quiet, has not vornited, and slept nearly the whole of the night in the abdominal position. He has now lain 48 hours on it's abdomen, only now and then short while at a time, for a change. He is now moved onto his hack and given liquid food. Later, continued improvement without complications.

The intestinal fistula on the ileum was closed under chloroform by enterorrhaphy on March 28, and the patient left for home in good condition on May 1

on May 1

CARE 5 R K., aged 65, a doctor in Christiania; treated at home Ile had for 52 years suffered from indigestion now and then, but never had been ill enough to have to neglect his practice. During has holiday trip in August, 1912, he had diarrhera and felt tired for a fortingth, but had improved considerably, when on August 25 he was taken ill with nausea and epigastire palin.

Aug. 30 — During the last five days the patient has had attacks of pain below the right costal margin, where a formerly more diffuse tenderness has become localized and increased in intensity; in the same place he feels an inspiratory "catch," and sometimes the pain radiates to the chest. He feels such, especially with movements of any kind, but movements of any kind, but the control of the co

Sept. 4.— The pain, fever and rigidity have disappeared, but there is still some tenderness below the right costal border. Flatus has been passed the whole tume. Yesterday and to-day, without inconvenience, the patient has had tea, tosat and milk gruel, after having been without food or drink for three days.

Sept. 5, 6 P. M.—The patient awoke at 4;50 this morains, feeling extremely raddy. Shutting has eyes, he felt better; but looking up, everything in the room seemed in a what. He began to vomit a thin hie-stained fluid. The vomiting came on again every time he took any fluid, with little evacuation at a time, but in the course of the day about a litte. When Dr. about a litte wo fluid with the course of the day about a litte of the day of the look was a pathic, his face pinched, how day. His look was a pathic, his face pinched, her with a frequency of 92. The abdomen was, in the left hypochondrium only, a little distended, but nowhere tender or rigid. By precussion the gastrice mowhere tender or rigid. By precussion the gastric

sound was found to extend from the left fourth pin in the minimality that to the unabletes. There was no fevet. As the condition was disgnosed as acute gastic distation, the prifent was ginen choice brtween stomach tube and alsommal posture, and preferred the latter. At 6,0 P. M., he was placed prione in bed supported by a number of pollons. Tood and ignik were forbiddien

An hour later Dr. Bull saw the patient again, and found his hands warm, the fare normal, the pulse roo and full, the nauses had ceased and the general

condition was satisfactory.

Sept 6 — The justient fernatined prone till 2.A.M., he was then turned on the right side. Since the abiliomizit posture was adopted, he has not someed, nor has he felt sick or gulidy. I rom 21 last night flatus has been passed.

Sept 7 - Still no comiting. Since yesterday the patient has taken 200 ccm milk and water and a

little bread.

Soft 21 — Uninterrupted recovery. The patient has neither left guldy not sick since the 5th. There has been no abdominal prin or tenderness not any gratific symptoms. The dulfy ration has successively been increased and his now reached 1500 calories. Dr. Bull aidds the following expensis. The patient

had on the 25th of Jugust probably acquired arute gastrius, perhaps caused by intestinal infertion In addition to this a slight peritonitis localized to the epigasteium and right hypochondeium ilevel oped, which, from its course probably was owing to an acute choleey stitis When the iliness had abated and the national began to take some nourishment, symptoms of acute gastric inlatation suidenly developed. As a necular and to the patient, distressing thaugural symptum of the ililatation the intense guddiness has to be noted, 12 hours later characteristic signs of collapse were present effect of the postural treatment was particularly noticeable within an hour not only to the iloctors who were present but also to the patient himself and to his relatives

The following two cases from the Rigshovpital were not treated with abdominal posture

CASE 6 1 I, male 20 years old sent to the Rigshospitals Surgical Division B May 20 1007 for tuberculosis of the kidueys

The patient has always been hoarse and prome to colds and cough, but otherwise well and especially free from gastric troubles. His present ulness commenced a year ago with painful and continual passing of urine. This condition have become worse by degrees, though the patient's general condition and appearance have suffered but slightly.

Operation June 5 nephrei tomia dextra was per-

formed under chloroform

June 6 — T 37 2, 36 3, 12 100 06 Since the operation, vomited four times, quantity of urine 050 rem. Milk and barley water given in teaspoonfuls.

June 7 - T 36 8, 17 1, P 130 Very restless during the night on account of pain over the whole of the abdomen, which was somewhat distended and tender yesternlay evening. He was given a rectal cemma of 3f hirr pesternlay seconing, after which the bowels mused freely. He somited a thin yellowgreen flund several times yesterday, also during the might at short intervals.

This morning with the stomach tuke we empticed i litre greensh fluid, which eased the parient. In the course of the day he was given 3 camphor injections and 1 of digalen. Amount of urine 750 cm.

June 8 ~ T sesseday excising 378, pulse thready, uncontable. The realient is quie conscious but somewhat resiless, and complains of influesc and prun in the abdomen. Vontuel three yestenlay. The whole abdomen, but especially the whole abdomen, but especially the progression, as distincted and tender. Session which he had a subcumenous saline injection of a three without onto eable effect. During the nation with the without content of the

At past mortem tuberculosis of the bladder and left hidney was found also considerable dilatation

of the stomach and duodenum

Case: Th. M., male aged 27, sent to the Rigshospitals Surgical Division B. October (6, 1910, for estermicalities tibus.

The patient has, during the last three or four years felt gains in his right leg when he exerted it; otherwise he has been well. Last week he had stokent pains and tenderness under the right knee, and one or two childs. His temperature throughout has been between it3 and to.

Therefore the section of the section

outes and a considerable quantity of pus evaruated Oct 24 Condition much hetter, senses clear,

but continued high fever

Nos r The skin over the tendo Achillis is necrosed. The fever has by degrees somewhat diminished.

Not 14 - F 37 6, 30 3 Since last night the patient has vomited as soon as he has partialen of food. To day the left suite of the abdomen is tender, and distended from the epigastrium to the pubes. The right side of the abdomen is not distended, but on the contrary is rather hollow.

Aov 15 — Distriction of the abdomen has increased and now remunds one of a strongly didated stomath. There is much tenderness, muscular rughits, and dull percussion sound in the distended part. which seems fluriousing. The tenderness, however, is so excessive that no examination is possible. The patient died at 4 o'clock this afternoon. Autopsy. General sepsis, pericarditis, miliary abscesses in the kidneys, parenchymatous degeneration of the spicen and liver, dilatation of the stomach

and duodenum.

The greatly dilated stomach reaches midway between the umbilicus and the symphysis, the duodenum, the common, cystic and hepatic ducts are also considerably distended

The following synopsis is based upon 144 cases of acute dilatation of the stomach — the 7 referred to above and 137 from the literature. With the exception of Jessop's and Hochenegg's two cases, which are included to complete the list of dilatations of the stomach treated by operation, all the others, which are culled from literature, date from later than 2895, the year in which Schmitzler suggested laying the patient prone in bed as a treatment or the illness. Thus, my work is partly a continuation of the latest published literary works of the American authors Conner and Laffer.¹

Of 130 cases where sex is mentioned, 78, or 60 per cent, were women and 52, or 40 per cent, men. The 118 cases where age is mentioned belong to the following decades:

This goes to prove the same proportion which Conner has found, that three fourths of the patients acquired their illness between the tenth and fortieth years Payer has the youngest patient, a boy 4 years old, and P Muller the eldest, a woman of 65

If one takes into consideration the condition of the patients when the dilatation of the stomach began, which must be supposed to have more or less affected the development of the dilatation, we can divide the cases into several groups, some of which are well defined

1. The post-operative cases contribute the largest number, with 92 cases out of 138 in which the condition when the dilatation occurred is mentioned, or 66.6 per cent.

"The collection from the European specially the Granan and Scan-

Laffer's review of the literature from 1908, without doubt the most complete printed, but which includes all earlier known cases, has by comparison only 38.2 per cent post-operative cases.

Of 92 operations, 71 are laparotomics and 21 extra-abdominal operations. Among the laparotomies, operations on the female genital organs give the largest and operations on the gall system the next largest contingent, with 30 and 17 cases respectively; after these come 8 appendix and 3 hernia operations, together with 7 intra-abdominal operations of different kinds, and finally a most remarkable secondary group, consisting of 6 operations on the stomach itself, a pyloric resection, a gastrojejunostomies, and 1 gastroduodenostomy (Tschudy, Zade, Haberer, Payer, Schilling, and Finney). Of the 20 extra abdominal operations, 5 were performed on the kidney, 8 on the extremities, and 1 on the face; the rest were on the thorax.

All the operations, with one exception, were performed under general narcosis. The narcosis administered was in 12 cases chloroform, in 3 ether, in 5 chloroform ether, in 1 chloroform-ether-caygen, in 2 chloroform-morphia, in 1 ether-scopolamin-morphia after veronal, in 1 ether-scopolamin-morphia after veronal, in 3 ether-morphia, and in 1 ether-morphia-atropin The statement made by von Herff and others, that chloroform is specially responsible for post-operative dilatation of the stomach, seems thus not consistent.

In 66 post-operative cases one could approximately decide the time for the appearance of the dilatation of the stomach. In 23 cases the illness commenced within the first two days. One will, however, be in doubt as to the time for the greater number of those cases belonging to the first 24 hours, as the symptoms of the dilatation under these circumstances are not easy to distinguish from narcosis vomiting. The illness commenced three days after the operation in 19 cases, about four days after in 5 cases, and five days later in 4 cases; I case dates from the sixth day and 2 cases from the seventh. It is thus shown that the majority of post-operative dilatations of the stomach commence about the third day, much oftener before than later.

The collection from the European especially the German and Scandmann Interface as any case nearly complete as to take best of my knowledge all certain cases of acute distation of the stomach mentioned between 16% and 190 are included. From the English and french but especially from the American provincial literature many are wanting. My collected references show which authors cases are only

It has even been observed that distention of the stomach can occur during the operation. Moorhead seems to have met the dilatation, so to say, in statu nascenti, during a laparotomy after a completed perincorrhaphy he noticed a tumor suddenly forming in the abdominal cavity; the tumor was incised and proved to be the stomach, which was then emptied by a tube.

On the other hand, some stray instances are found where the dilatation occurred much later than mentioned above. Thus, Chavannaz saw it commence the ninth. Mayo Robson the tenth and fourteenth, and Nakahara the sixteenth day. In our Case 7 the illness commenced on the twenty-fourth and in Jesson's case the thirtieth day after the operation. These gastric dilatations which appear so late, after the effect of the narcosis and the operative insult must be considered as having passed, cannot correctly be termed post-operative. Then such cases may either be referred to an incidental cause during reconvalescence or to a severe illness following upon the operation. In Nakahara's case tetanus supervened; in our Case 7, general sepsis. Such cases ought perhaps to have been noted under the next group.

 Dilatation of the stomach which has arisen during the course of an acute illness or its reconvalescence. Fitteen cases belong to this group; 7 caused by pneumonia, 4 by typhoid fever, and r each by scarlatina, acute rheumatism, endocarditis, and cholecystitis.

Dilatation occurred during pneumonia in cases on the fifth day of their illness, in Hertick's case on the ninth, and in Leonhardt's 2 cases the eighth and sixteenth days, respectively

Among the cases of typhoid lever, Wichern's 2 patients developed dilatation of the stomach after 21 and 26 days, Baumber's in the fifth week, and Heine-Ewald's "during reconvalescence." Likewise Albu's and Bloodgood's patients were reconvalescents after scarlatina and acute rheumatism, and my patient No. 5 after cholecystifis At what stage of his endocarditis Mayo Robson's patient developed dilatation is not mentioned.

It is stated that Bloodgood's and Băumler's patients had good appetite during the last few days, Wichern's patient No. 2 had kypboscoliosis. As regards the others in this group, no mention is made of any fact which can have contributed to the development of the dilatation. In my Case 5, the dilatation began after the first food taken after 3

days of fasting. 3. Dilatation during chronic illness. Of such cases we find two during consumption of the lungs (Conner, Hanssen), 1 during diabetes (Hanssen), r during sciatica (Baumler). The patients here referred to are as a rule emaciated and exhausted, in a debility which nearly equals a post-operative state; but the group also includes cases in good condition. In Conner's case one comes to the conclusion that an irregularity of diet or overfilling of the stomach was probably the incidental cause. It is mentioned that the patient had eaten better a day or two preceding the dilatation. In one of Hanssen's cases (No. o) the dilatation, which was not observed during life, seems to have arisen just before death, while his other patient belonging to this group (No. 8) was in comparatively good condition In none of the cases do we find any mention of an incidental cause, in Baumler's case (No. 2) it is positively stated that irregularity of diet or other incidental cause was not traceable.

4. Dilatation of the stemach by disorder or deformity of the spine. Under this heading we find Kelling's case of highly developed lumbodorsal scollosis and 6 cases of spondy-title kyphosis with or without scollosis (Kirch's, Neck's cases 2 and 3, Kausch's two cases, and Ilanssen's Case 7). Withern's second patient suffering from typhoid fever also had a right kyphoscollosis. In Kausch's Case 2 and Hanssen's Case 9 the tuberculosis of the spine had entailed a more or less pronounced paraplegia, and they can therefore be compared with Bloodgood's Case 4 of paraplegia, caused by syphillitic myellits.

This group comprises highly dissimilar and for the most part complicated cases. The three paraplegic patients are all much reduced by their chronic illness, and if this had not been allied to a nerve trouble, their

right place would have been in Group III. In Hanssen's case, without doubt, the primary cause of the dilatation's commencement lies in the presence of the enormous dorsolumbar scoliosis, which hardly left space for a finger between the xyphoid process and the spine; over this the duodenum rides, and thus opportunity for a kink or compression of the intestine is given. In the other cases it is scarcely reasonable to think that the scoliosis (sometimes right and sometimes left) or an inveterate kyphosis has been the only reason for the dilatation On the contrary, one may be inclined to doubt whether the spinal disorder has had any influence on the onset of the dilatation at all. For with Kelling's, Kirch's and Neck's (No. 3) patients, all of whom were somewhat delicate but were in ordinary health at the time of the illness' commencement, the dilatation arose in direct connection with a palpable overloading of the stomach. Kelling's patient, who usually ate enormously, had eaten Schopsenfleisch with beans and two unpeeled pears the third day after fitting a new corset, Kirch's had had three platefuls of bread soup and a glass of Weiss beer; and Neck's patient No 3, three bowlfuls of buttermilk, when the illness broke out. Of Neck's 40-year-old patient, who had always been well and without digestive or intestinal troubles of any kind, the only factor predisposing for dilatation of the stomach which is mentioned was a stationary dorsal kyphoscoliosis of long standing.

A remarkable group is composed of cases in which the dilutation is attributed to overloading of the stomach. Under this heading I have included only patients with whom no other explanation is found for their illness, or where other conditions, such as a slight weakness or earlier dyspepsia, are quite insignificant beside the single overloading. Of this sort the collection contains 10 cases: Bastedo's (Nos 2 and 3), Hanssen-Loberg's, Heine's, Hoffmann's, Houston's, Korte's, Landahl's, Sommarin's, and Wahlstrom's But it is doubtful whether several cases from the previously mentioned groups do not by right belong here As an instance, Kelling's patient is placed by Conner in this category, and Kirch's and Neck's (No. 3) cases probably ought also to have been included.

Some of these patients have been somewhat weakly and others formerly had dyspeptic symptoms now and then, but on the whole the group seems to comprise healthy people in the ordinary sense of the word. Of their earlier bealth nothing is said in Houston's. Korte's and Bastedo's (No. 2) cases; of Heine's, Landahl's and Bastedo's (No. 3) patients it is remarked that they were in a good state of bealth, but had now and then had dyspeptic symptoms; Wahlstrom's tient was delicate, but Hanssen-Loberg's, Sommarin's and Hoffmann's were quite well -- the last two accustomed to overfeeding; it is remarked of Hoffmann's patient that he usually had a large appetite and often ate three or four times more than others and without masticating his food: "er schlang vielmehr das Essen hinunter."

Hoffmann's, Landahl's and Hanssen-Löberg's patients came home tired after enervating work; the last named, as well as Korte's patient, ate in haste, and with Bastedo's patient (No. 3), the stomach became suddenly distended by a "very big dose" of tartaric acid and sodium. In the other cases, special circumstances with the overloading were not given, and its nature and degree are in the different cases very varied. In Hanssen-Loberg's, Korte's and Bastedo's (No. 2) cases the dilatation made its appearance immediately after a hearty meal, consisting of six meat cakes and a plateful of soup in the former, of "Mohrrueben" in the second, and in the last-named of bam and cabbage; in Houston's, Landahl's and Sommarin's cases the overloading was caused by raw fruit; Heine's patient had. besides whisky, drunk three or four bottles of champagne. With Hoffmann's gluttonous patient the critical meal was not particularly big, and in Wahlstrom's case it is only stated that the illness made its appearance "after breakfast."

In 8 of these cases the time between the meal, i. e. the inflating of the abdomen in Bastedo's Case 2, and the commencement of the illness is noted. In both Bastedo's and Hoffmann's cases the disease began at

once; in Heine's and Landahl's it began after 6 to 8 hours; in all these cases in full violence from the beginning. In Wahlstrom's and Sommarin's cases the malady seems to have begun, but not severely, after the lapse of a few hours and 12 to 16 hours respectively. The illness reached its full lintensity two days later in both cases. We have specially accurate particulars of Hanssen-Loberg's patient. He became violently ill an hour after a meal, and was operated 3 or 4 hours later, it the stomach was then distended nearly to the pubbe.

to the pubes. Six of these 10 patients died With 3 of them the diagnosis was verified both by operation and post-mortem (Hanssen Loberg's, Hoffmann's and Korte's), with Sommarin's by operation and Wahlstrom's post-mortem. It is thus proved that even in the case of a person in good health a severe dilatation can develop after a single more or less considerable overloading of the stomach Overexertion and earlier digestive troubles seem to be predisposing factors The quickness with which the stomach has been overfilled plays probably also an important part. We find several typical instances of the same kind from olden days, among these Winge's case (Hanssen's Case 1).

As an appendix to this group, we can include Kayser's Case r In this instance it is the quality of the food and not the quantity which is the cause of the dilatation it appears

to have been a meat poisoning
6. A blow on the abdomen is named as the
cause in Appel's and Box and Wallace's cases
Both patients were sent to the hospital with
the diagnosis of ileus. The time elapsing
between the injury and the commencement
of the illness is not mentioned. In both cases
dilatation of the stomach was proced both by
laparatoniny and post-mortern

7 Confinement is likewise followed by dilatation of the stomach in two cases (Campbell, Thomson and Laffer) The dilatation was noticed in the first hours after birth in both cases, and both ended fatally

 Finally we have a last group, without ony explanation for the dilatation. In two cases (those of W. H. Brown and Wright) the illness 'The operator's statement commenced with the appearance of ileus in two quite healthy subjects, and without known cause. Schmorl's patient also belongs most reasonably to this category, he having been taken ill, as recorded, after violent laughter.

It must also be mentioned that there sometimes seems to be present an individual disposition to acute dilatation of the stomach. Legueu first drew attention to this fact. He noticed such a condition after performing two operations with a long interval on the same man. Later Chavannaz, Payer, and Bloodgood (Case 6) made the same observation, The latter's patient was operated twice with a 6 months interval, and both times for an ingunal hernia The first operation was performed under ether, the last under local anæsthesia, as far as I know the only case in which dilatation of the stomach has occurred after the use of a local angesthetic. Such a disposition seems, however, not to exist in every case My patient No 2 was readmitted to Diakonhjemmet with rupture of a tubal pregnancy, and was operated two years after the above described operation. The circumstances were similar to those two years ago, excepting that a strict control was kept over the fluid which the patient drank. This time no symptoms of gastric dilatation were noticed.

The chief symptoms are vomiting, obdominal distention and collapse. Symptoms of secondary rank are pain and tenderness over the distended stomach, insufferable thirst, and scanty urine. The function of the intestine is different un different cases, it may have cased or be more or less uninfluenced.

The better the patient feels beforehand, the more sharply defined the symptoms of the dulatation of the stomach appear. One therefore sees the illness in its purest form after less serious operations; it becomes most conspicuous, however, after the overloading of the stomach in healthy persons. In a case of medium severity, the dilatation will as a rule first show itself by the patient complaining of pam and distention of the epigastrium together with increasing thirst. He will then begin to vomit without subsequent relief.

The vomiting occurs at short intervals, and once commenced, it becomes one of the illness's most prominent features, which Legueu has appropriately compared with the continual emptying of the urinary bladder under an ischuria paradoxa. A distention of the stomach develops rapidly. From the commencement it includes the epigastrium; by degrees it extends downward past the navel. and can perhaps reach to the lower parts of the abdomen The stomach which was normal at an operation yesterday may to-day have become evanotic and hyperæmic and occupy the greater part of the abdominal cavity. Tor,as Riedel says, it is a decided fact that a formerly sound stomach can expand quite down to the pubes in the course of 24 to 48 hours 1 This can even, as Hanssen-Loberg's case shows, happen after the lapse of a few hours. As a rule the distention is largest in the left side of the abdomen, while the right takes little if any part This is accounted for by the form an extremely distended stomach assumes. Like a thick tube, its fundus part runs in a curve down toward the left Poupart's ligament; here it bends at an acute angle and a similar pyloric tube runs nearly along the longitudinal axis of the body upward to the right border of the gastrohepatic omentum.

The general condition of the patient is from the beginning less affected than one would imagine by the constant vomiting and the thirst and distention of the epigastrium are the chief troubles. Especially is this the case with continual and regular emptying of the stomach As the days pass, the patient's strength sinks, while the frequency of the pulse increases At one stroke the whole condition may change. In the course of a few hours the patient can sink into deep collapse, with hollow eyes, shrunken cheeks, cold limbs, and thready and extremely rapid pulse. Sometimes the collapse comes quite suddenly and death occurs in a moment, notwithstanding the fact that the condition hitherto has not been especially disquieting. In severe cases the collapse will occur earlier, and in many of these cases the sudden appearance of collapse is the first phenomenon of the illness (Bastedo, Borchardt, Braun and Seidel, Haberer, and Leonhardt).

Upon examination of the abdomen one will find that it is tender. The tenderness commences in the epigastrium and extends downward with the increasing dilatation of the stomach, it is, however, of greatest intensity during the beginning of the dilatation, while the excessively distended stomach often is less tender or not at all. As a rule, a distention will be noticeable which has reached some size The outlines of the stomach are in most cases quite distinguishable. There are, however, cases noted where an excessively distended stomach has not had the slightest influence on the shape of the abdomen. In the ordinary course of things, splashing sounds elicited by percussion or shaking of the abdomen will show that one has to deal with a large collection of fluid or gas in a distended intestine. So excessively may the stomach be distended upward also, that succussion sounds are produced by the heartbeats and occur simultaneously with the movements of the heart (Leanhardt's Case 2). Sometimes the outlines of the distended stomach are indicated by a symptom which gives the highly interesting evidence that the stomach is not paralysed, namely, by ersible peristalsis (Baillet's Case 1. Baumler, Bloodgood's Case 1, Braun and Seidel's Case 6, Haberer, Heine-Ewald, Herrick, Lehmann and Stewart) If a stomach tube is introduced in a severe case, gas and fluid will be expelled with great force, often quite as a small explosion, and, especially under the first evacuation, in large quantities. If one is in doubt as to the seat of the distention, one will not remain so, as with the emptying or lessening of the contents of the stomach the distended abdomen collapses.

The contents of the stomach are watery, and in the beginning yellouish or greenish; later they become brown or black with the mixture of blood From the commencement the fluid is odorless, but becomes more and more offensive, and sometimes fetid, or of a sweetish, nauesating smell, in some cases, but scarcely correctly, called feculent. It contains bile as a rule; otherwise the contents are very different. Sometimes it contains little, sometimes a considerable amount, of free

[&]quot;Gallensteinkennkheit mit und ohne Ikterus " Berlim #5g2

hydrochloric acid; at other times it is without or with abundant lactic acid. In one of Wichern's cases it contained coli bacilli, streptococci and staphylococci. Its bulk is in most cases considerable. As a general rule a single vomiting does not evacuate much, but as the vomiting continues at intervals all day, the quantity vomited becomes a lair amount The vomiting is often described as profuse. but whether great or little, only a small part of the contents of the stomach is evacuated. Even immediately after a vomiting the stomach tube will evacuate more than several vomitings, and sometimes the first introduction of the stomach tube has removed many litres; for instance, in Neck's first case, directly after a copious vomiting, 41/2 litres, and in Borchardt's case, half a bucketful. remarkable how quickly the stomach may refill after emptying. An increased secretion probably takes place in every acutely distended stomach, but in very different degrees. In my first two cases the secretion was not noticeably large, but it is sometimes enormous. Morris considered this the most important point of the condition, and suggested the name gastrosucorrhœa," and Zweifel thinks the stomach's copious bypersecretion characterized by the pictorial remark. "Als wollt' es sich nimmer erschopfen und leeren, als wollte das Meer noch ein Meer gebaren" It is remarkable, therefore, that vomiting sometimes fails to appear This is not even an unusual event, one certainly does not olten find the non-appearance of vomiting directly remarked upon as with Box, Chavannaz, Conner, Delagenière, Legueu, and von Herff (Case 2), but there are several cases in which vomiting is not mentioned (Houston, Nicolaysen, von Herff's Case 1, Braun and Seidel's Case 4, Bloodgood's Case 6, and others) More frequent and easier to understand is the observation that vomiting, which has been present earlier in the illness, ceases the last hours before death

Pain is present as a rule, but is of various severity. It generally confines itself to the epigastrium and umbifical region. In many cases the illness commences with a cry of pain from the patient; sometimes he lies day after day moaning continually. Bull's patient (my Case 3) lay two days and nights, so to say, in one constant scream; my patient No. 2 complained without pause, while the pain in my first case was unnoticeable as compared with the thirst and vomiting. Absolute fredom from pain is comparatively rare. Conner found, in his cassuistic review, the presence of pain mentioned in 42 cases; in 35 of these the pain was said to be more or less severe. The absence of pain was noticed in only 7 cases.

Thirst is one of the most constant symptoms, and sometimes it becomes severe beyond description. The patient's craving for something to drink, as for instance in my first case, may be so intense that it is extremely difficult to refuse. And many a surgeon can no doubt say, with Laffer, that the terrible, agonizing thirst which could not be relieved either by saline transitusion, enemata, or by drinking has left the deepest impression on his mind. In connection with the desire for fluid is the decrease of the urine, which can lead to suppression. The quantity of urine is, however, in many cases less influenced by the continual yomiting than one would

expect. The intestinal function seems often to be quite independent of the dilatation of the stomach It is, as a rule, sedulously noticed in post-operative cases. Flatus and movement of the bowels have often both ceased. and their recommencement is one of the first signs of improvement, but in many cases the dilatation of the stomach is accompanied by diarrhora It is of interest to notice that the action of the bowels has been unimpaired, even in several cases where mesenterial compression has been present (Engström, Walzberg, Zade, and Bull) It is thus shown that Braun and Seidel incorrectly consider maintained intestinal function as a proof of free passage through the duodenum.

A rare symptom is hiccough. Cyanosis is observed by Leonhardt, Mayo Robson, and Templeton, giddiness by Bull and Heine, and syncope by Bloodrood.

PROGNOSIS

Of 144 cases, 78, or 54 1 per cent died Conner's statistics from 1907 show a mortality of 72.5 per cent and Laffer's from 1908 63 5 per cent. One can judge from this that the prognosis, with the sharper diagnosis and earlier treatment, has steadily improved in time. For the 80 cases in my grouping from the time subsequent to Conner's statistics, the death rate has decreased to 36.2 per cent; and apart from 8 of these cases, in which dilatation was treated by operation, and all of whom died, the death rate for my remaining 72 cases from the time after 1007 sinks to 26.2 per cent.

We get, however, a truer picture of the significance of the illness by considering the cases which bave not been treated, or only medically. Their number is 31; of these 20 died; Bastedo's patient No. 2 was cured with apomorphin, and Häberlin's case, which was not understood to be dilatation of the stomach, by bypodermoclysis. It is seen that many of the authors who have occupied themselves with this subject presume that the literature does not give a correct expression for the prognosis of the illness; as many lighter and cured cases are not included because they are overlooked. One may be allowed to doubt the correctness of this statement. An acute dilatation of the stomach has not much disposition to spontaneous cure. Among other circumstances, the extremely unfavorable influence of fluids and the patient's agonizing thirst are likely to act in the opposite direction. One can form an opinion of the illness's duration from the outline which is given for 21 of the 31 cases medically treated or untreated, of which 20. as before stated, ended fatally. In 2 cases (Conner's and Nicolaysen's) death occurred in 3 and 5 hours, respectively, after the first symptoms of dilatation; in a cases, after 1 to 2 days; in 4 cases, after 2 to 3; and in 2 cases, after 4 days. In 4 cases the illness lasted between 6 and o days. The illness, in more than half of these cases, thus came to a fatal end in two days, or even shorter time With those patients whose stomach bad been emptied more or less regularly with the tube the duration of the illness was much more variable, and sometimes was quite protracted In Herrick's Case 2 death occurred on the twelfth day, in Baumler's very typical case (No. 1) on the thirteenth, and in Kausch's case the sixteenth day after the commencement of the

dilatation. On the other hand, several of the patients who were treated with stomach tube died in less than a day. In several cases the dilatation reappeared after the first food or drink, and in some cases it continued for some time even after the severe symptoms had disappeared. The Rontgen examination of Sommarin's patient showed that the stomach, even after the lapse of a month, reached to 3 cm. below the navel.

Pathological anatomy. The stomach is always more or less distended. The distention will sometimes be as in our Case 3, comparatively slight, and show itself principally by the globular shape of the stomach; the latter sometimes extends downward right into the pelvis, very often to the symphysis, under these circumstances, according to Fenger, looking like a huge, bent arm with

the elbow near the pelvis.

Between these extremes one finds many variations. The excessively distended wall of the stomach is usually described as quite thin. In Nicolaysen's case the stomach is compared to an infiated pig's bladder, in Leonhard's and Hanssen-Loberg's cases to a marketballoon, and the contents of the stomach were in the latter case visible through the thin wall. Its color is red or bluish, with lesser distention gray or gray-blue. In the mucous membrane regular extravasations are to be found, and often superficial erosions, which explain why the vomitted matter by degrees assumes a hemorrhaptic character.

In Thomson's first case the pylorus was obstructed by a tumor. In Kayser's second and Kausch's first case there was a kinking of the duodenum between the horizontal and descending parts. In the older literature one finds, especially in gall-stone cases, several instances of acute dilatation of the stomach ascribed to occlusion of the upper part of the duodenum by adhesions. When the duodenum is mentioned in the post-mortem accounts it is usually described as being distended. The distention has generally been seen to occupy the upper part of the duodenum, while the lower part seems not to have been inspected. The arterio-mesenteric compression at the duodeno-jejunal junction, which plays so important a part in the discussion of the illness'

etiology, is only mentioned by a few authors: P. A. Albrecht, Baumler, Bloodgood (2 cases), Binzwanger, Conner, Engstrom, Finney, Hanssen, Kausch, Lehmann, Leonhardt, Muller (2 cases), Payer, Schmorl, Stieda, Walzberg and Zade. Added to these come 3 cases where arterio-mesenteric compression is noticed during the operation, by Tschudy, Bloodgood and Bull (my Case 3). Baillet, Box and Wallace (cases 2 and 3), Neck. Petit and Wichern have noticed that the dilatation extended to the lower end of the duodenum. but make no mention of a compression by the mesenteric artery. Baillet, Engstrom, and Wichern saw at the duodeno-je junal junction a furrow or constriction on the duodenum; Baumler saw, on the part compressed by the mesentery, a rose colored stripe on the serosa and corresponding to it a necrosis in the otherwise normal mucous membrane, 1 5 cm, broad, nearly circular, but superficial The fact that the arterio mesenteric condition has been mentioned in but comparatively few cases can hardly be taken as evidence that compression at the duodeno-jetunal junction has not oftener been present. One is scarcely mistaken in the surmise that a pathologist who does not in his post-mortem account of a case of acute dilatation of the stomach remark upon such a peculiar and, for the illness, significant fact as the arterio-mesenteric compression, either has not been acquainted with it or has neglected the search for its presence. the remark, that we find only that for which we are looking, can also be applied to a post-

mortem. About the small intestine the literature contains little. When it is mentioned it is generally described as collapsed and lying in the pelvis. It has sometimes been noted that the mesentery was exactly so long, that the small intestines hung down into the pelvis, and in this way causing that pull on the mesentery and the mesenteric artery which produces the compression of the duodenum between the mesentery and spine. In a group of collected cases and in those above mentioned an increased lordosis was noted on which the duodenum was thought to ride, thus becoming kinked or compressed

TREATMENT

The treatment is not the least interesting chapter in this peculiar, and formerly nearly always fatal, illness. In the tapid development therapy has undergone in the last fifty years, restoration to health has taken place in a great number of cases which formerly would have been more or less hopeless. The greatest triumphs are achieved by operative surgery. With the acute dilutation of the stomach, however, this has been obliged to admit defeat; on the other hand, results which can compare with surgery's best have been attained by the simplest means

Among prophylactic measures, too energetic preoperative evacuations of the intesting are cautioned against, and probably with good reason The danger herewith is presumed partly to be in the debilitation of the nation). partly in so thorough an emptying of the small intestine that its sinking into the pelvis, with following tightening of the mesentery, is favored It is of great importance, both after operation and during convalescence, to be extremely careful with food supplies in abundance. This rule, correct both in fact and practice, was earlier upheld by Laache. Of the north of subcutaneous strychnin injections before laparotomies, which by some surgeons are systematically used. I do not

venture to express an opinion.

If the dilatation has first developed, one can hardly hope for results from internal armednes. All those remedies which were suggested in former years, when the illness was fart known, have now none but historical interest. Among these are atropin, ezerin, morphia, strychmia and apomorphin. It is doubtful if horizonal, which recently has been tried, is of any greater value. Faradization and cold compresses, which in the skittles and seventies were recommended by Furshref and Erdmann, are takewise obsolete remedies.

It is certainly true that a subcutaneous injection of apomorphin in Bastedo's Case 2 seems to have produced a life-saving emptying of the stomach, but for the evacuation of the overchaged stomach we have an easier remedy in the stomach tube. An energetic and

Bert ibn Bebriebe 1876 141 Parhows Arch Ed 43 189

continual exacuation by the tube has become the principal resource in a case of acute dilatation of the stomach. And with reason. Nothing is more rational than to unload the overcharged and strongly hyper-ecerning stomach, and it is obvious that the sooner and oftener this is done the more satisfactory is the result. If the evacuation takes place only after the stumach is distended to the maximum and the patient's strength has sunk in the extreme, the diminution attained, even the momentary total evacuation of the contents of the stomach, will often be in vain An early and complete emptying are alike desirable. Often, however, this is accomplished with difficulty The greatly distended stomach is full of gas and fluid, and the latter will, when the patient is lying in bed, mould the thin and yielding stomach to the excavations of the posterior abdominal wall bring the tube under the surface of the fluid is, under these circumstances, not always easy. One has to try tubing with the patient lying in different positions | Lievation of the pelvis. for instance, is often necessary to drive the fluid higher up in the abdominal cavity. That one must also insert the tuhe much deeper than usual is evident Delagenière, Houston and Lehmann introduced the stomach tube in vain, with Bloodgood's patient its intro duction had to be given up on account of the alarming symptoms it caused, and you Herff met with an obstacle in the cardia, which was only overcome by the use of a stiff tube correct and consistent tube treatment must, however, be supported in different ways this belong reasonable stimulation of the heart and a compensation for the patient's enormous loss of fluid by giving intravenous. subcutaneous, or rectal infusions

It seems to be a generally accepted view that the treatment with the stomach tube affords sufficient help for curing an acute diffraction of the stomach. This opinion is urged, by Braun and Scidel among others; and Ilaberer declares that the often serious cases of this illness which in the course of time have occurred in the first surgical clinic in Vienna are all cured, and mostly in this way. Neither he nor Korte have seen an unsatisfactory result in an uncomplicated case of primary postoperative dilatation of the stomach. I have, however, much difficulty in adopting soptimistic a view of the effect of the tube treatment. I am prevented therefrom by the knowledge gained both from the literature and from my own experience.

Of the 48 patients in this summary treated by stomach tube, 24 were cured and 24 died (Table I) The high death rate in a number of cases similarly treated during recent years must arouse a doubt as to the officacy of the treatment even under favorable circumstan-It is difficult to believe that such severe complications have been present in half the number of cases, or so deficient a use of an otherwise effective measure, that this has altogether failed. There are also among these 24 fatal cases some which go to show that even in an uncomplicated case a satisfactory result is not necessarily attained by an evacuation of the stomach even if it is begun early and continued twice daily. this class belongs, for instance, von Hersi's case (No. 2), where at the post-mortem there was found no other cause for death than the considerable but uncomplicated dilatation of the stomach Although a post-mortem is wanting, Laffer's second case also seems likely to arouse some doubt as to the absolute efficiency of the stomach tube. This doubt is increased by considering those cases in which the tube was used without result. though change of posture brought instant relief Among these I must specially mention Walzberg's case and my Case i. In these cases the emptying commented 12 and 8 hours, re-pectively, after the first symptoms of the dilatation; in both cases evacuation was continued, morning and evening, for two days, but with the reverse of improvement, and in both cases change of posture was effective at once. On the whole, we find many cases, described in more or less detail, in which an early tube treatment led to no result. Here, among others, belongs Baillet's patient, operated upon later, and also the same author's two cases which were treated by the stomach tube alone.

Upon consideration of the tube-treated cases collected in Table I, another fact will be noticeable. This is, that the result of a late

SURGERY, GYNECOLOGY AND OBSTETRICS

TABLE I-CASES TREATED BY STOMACH TUBE

				1			
Releience	and Age	Previous Condition	Dilatation when	Incdental couse	Storach tybe first used, when	Resell	Remarks
P A Albrecht	1 30	Tuberculous, Resect so cubiti	41 h day		6th day	Died 10th day	Post-mortem Arterio- biesenteric compression
Albu	M só	Scatlet lever	Itik day	Gluttenous appetite had returned	as firs. after distation	Died ao bra. jatee	Post morters Stomach enormously distended.
Baillet	F	Overlotomy	1		Directly alter distation	Died 815 day alter operat.	
	1	Chalceystectomy			Directly after distation	Deed 8th day after operat	
Baumles	i es	Typhoid fever	5th week	Appetite quality increased	country distance		Post mortem Arterio- mescateric compressos Farrow on serosa, circula necrosis of mucosa
Beck	1,5	Appen feel amy	14 day	1	as hes beloze deletation	Cured	
Bumbaum	11	Hystero-myomeciomy	4th day		6-8 hrs. ufter difatation	Cured	Condition seemed hopeless Unespected improvement
B'uolgoot (VI)	31 53	Fadical operation	deryp		Sonn after dilatation	Cared	Castor ad was found in the stomach after 17 brs.
Horchgrevink (V)	M	Nephreciomy	ad day		Soon after dilata son	Dod 31 day	
Braun and	F 30	Safpingolomy	3 14 daya after operal	Eatterne third drash much	36 hrs. after dilatation	Cured	
liraun and Seviel	l c5	Salpingeromy	a) i days after operat	Patient drank very much	do brs. after dilatation	Cored	
Braus an i berfel	14	Appendectamy	1 days after operat	Severe thirst, drank much	atoghm aftet d latation	Cuted	
Braun and Seidel	M 45	Appendectomy	3 days after opecal	Plenty of wine and water taken	s to a bro after dilatation	Cured	tomiting not mentioned
Braum and Sexiel	15	Choletystotomy	ad day	Bildsteetly tiles test sold food	Shortly after dilatation	Lutted	
Braun and Septel	M	L rei brolomia seterma	418 day		Duretly after dilatal son	Cured	teatric periodales visible
P Bull	M 17	Amputatio crutis	od day		pd day	Cured	
Engeltim	45	Hyslero-my othectomy	416-619	Ili after hearty donner	24 hrs after dilacation	Died	Death directly after evacua- tion Actes to-mesentes & compression
O Hanssen	M	Diabetes			\$ hrs after delatation	Died 24 bra later	
Heme	M 34	Good health		ill after 3 of 4 bettles of chiam pager etc.	g bry safter dalatation	Curel	At the beginning of dulatation fouch distincts
Heine Ewall	M 16	Reconvalueence after typhoid lever		Excess in drink ing	as to 30 fers after delatation	Exred	Gestrie perutalna visible
Hellendahl	F	intra abdominal abort caing of round hig amenia	yd day		Decetty after distation	Cuted	
v Heiff	F 40	Supravaginal hysterectomy	5th day		Shortly after dilatation	Cured	
v Herd	F 47	Vaginal hysterectomy	2d day		4th day	Died 8th day	No vomiting Only a ctiff atomach title could be in trodiced Evacuation twice duly
Henrik	E SS	Cholocystectomy	2d day		,	Daluthday	
Kausch	Γ	Spondy little paraplegia	If the day after antroduction of weight extension		24 ftm after dilatation	Deed 15 days later	Post mortem: Arterio- mosenieric compression ceased by litting of the uppermost jejunal coil

TABLE I (CONTINUED) - CASES TREATED BY STOMACH TUBE

Reference	Sex and Age	Previous Condition	Dilatation, when	Incidental Cause	Stomach tube first used, when	Result	Remarks
Kayser	F 37	Intestinal houstomoses, etc.	yth day	Ill after baving drunk a quan- tity of but termilk	Shortly after the dista- tion	Died 8th day	Post mortem Enormously disteoded stomach Duo- denum kinked below the liver
Kirch	M	Delicate kypho- teoliatic		III directly af ter supper of 3 platefuls of bread soup	4 days after dustation	Died 24 hrs later	Exploratory aspiration of the stomach
Laifer	M 17	Empyema of antrum of Highmost drained	sjth day	Had lately taken a large amount of malk and water	Directly after delatation	Died 16th day	Stomach tube used regularly twice daily until death
Laffer	M	Appendicitis operation	24 hrs. later			Cured	
I-Ser	M	Paraplegia syphilitica			The day after the dilata- tion	Died 24 hrs. after dilata- tion	Post mortem Gastric but not dundenal duatation
Landshi	H ti	Good health		After exertion plenty of water and yaw fruit	45 hrs after dilatation	Died 15 brs. later	
Legueu	F	Nephrectomy	3d day		7 hrs after dilatation	Died 6th day	No vomiting
Leonhardt	M 39	Pasumonia	toth day		4 days efter dilatation	Cured	By stomach tube, snormous quantitates evacuated
Leonbardt	14	Parutaonia	9th day		a days after dilatetion	Died zeth day	Splashing sounds coincident with the movements of the heart
P Moller	F	Cholecystotomy	ad day		t day after destation	Cured	Stomach distended toward pubes
Neck	34	Rathar delicate		It after baving eaten much raw fruit	5 days after dilatation	Cuted	Directly after copious vomit- ing 43f litres execuated by stomach tube
Neck	F 40	Kyphoscobotic, but bealthy		The dilatation was ones plainable	S days after distantion	Cured	First evacuation gave a
Neck	M 42	Tuberculous kypho- scoliotic	Shortly after aupper	Two platefuls ni buttermik tor supper	3 days after datation	Died 5 hrs later	Exploratory aspiration First evacuation gave 3 litres
Neck	M	Tuberculosis]	After dose of veround		Cuted	
Payer	F 33	Nephrectomy	5th day	Ili after an orange	7th day	Deed 8th day	Post mortem Arterio mescoteric compression
Robson (V)	F	Cholecystotomy	7th day		a to a days af- ter dilatation	Cured	Collapse, cyanosis anurio
Robson (VI)	F	Hymeretomy	14th day	Ill after a raw apple	n days alter dilatation	Cured	Stomseh distended to the
Schilling	F 45	Hysterectamy	zd day		Shortly after dilatation	Cured	Condition for 8 days seem- mely hopeless, then sud- den improvement
Thom&	F	Tubal pregnancy,	3d day		4 to 6 hrs after dilatation	Cured	5th day, new dilatation after
Thomsoo	F	Confinement	6 hrs after delivery		Directly after ddatation	Died 6 hrs later	
Walzberg	F	Hepatic sheets	ad day		25 hrs after distation	Died 8th day	Post mortem Gastro-duo- denal dilatation, arterio- mesenterie compression
Wschern	F	Typhoid fever	arst day		20 brs after ddata110.2	Died 23d day	Post mortem No furrow on duodenum as in Wichern a first case
Zade	F 3	Gastro-enterostomy	3d day		8 hrs after distation	Died 2 hrs later	Post mortem Arterno-mes- enterie compression, exces- sive dilatation

commenced tube treatment is not always as bad as might be expected. Braun and Seidel's Case 2, Leonhardt's Case 1, and Neck's cases I and 2, in which treatment by the tube seems to have commenced about 60 hours (4, 5 and 8 days, respectively) after the first symptoms of dilatation, are instances of this kind ending favorably. Kelling's case, so accurately observed and described, also belongs to this class, inasmuch as restoration to health must rather be ascribed to the gastric lavage than to the change of position The evacuation commenced, as the author explicitly states, 31/2 days after the onset of the dilatation. The impression which these observations leave is that the effect of the evacuation of the stomach not only depends upon early, continual and complete execution, which are a matter of course with every sort of treatment. On the contrary, it seems reasonable to suppose that special anatomical or functional conditions may be present or have reached such a develonment that they destroy the effect of the tubing in one case, but not in others one asks involuntarily if it may not be the duodenal occlusion, to which under the ctiology we again and again return, which, once developed either alone or in connection with gastric hypersecretion, annuls the results of the stomach tube treatment in some cases

In former days one felt obliged to operate the patient when the treatment with the stomach tube proved inefficacious. If we look at the results attained by operative treatment for acute dilatation of the stomach,

we meet with no encouragement There are 4 groups of operations in 5 cases, gastro-jejunostomy, partly with anterior and partly with posterior anastomosis, and in 11 cases, gastrotomy or gastrostomy lejunostony has been performed once, and a last group comprises 6 cases treated by laparotomy, with or without evacuation of the non-incised stomach, or with undoing of a duodenal compression To this last group Borchardt's and Bull's patients (my Case 3) properly belong On account of the postural treatment instituted after the operation, however, these two cases are recorded among those treated by change of position (Table III).

The cases treated by gastro-enterostomy are Baillet's, Korte's, Remond's, Robinson's, and Tschudy's. Among these, the dilatation in Baillet's and Tschudy's cases was post-operative, after exarticulation of the arm and resection of the pylorus; in Korte's case it developed after overloading of the stomach in a formerly healthy individual. In the other cases, there is no information as to the origin of the dilatation. Of all of them, Robinson's patient is the only one who lived; the other 4 are dead. Baillet's patient died 12 hours after the gastro-enterostomy; Korte's, after 5 days' promising convalescence and as a result of a perforated necrotic spot in the stomach, Tschudy's patient survived the last operation 11 days, dying of pneumonia. The accompanying circumstances give a certain explanation for the different results Both Korte's and Tschudy's patients were operated upon shortly after the onset of the dilatation, while in the case of Baillet's patient the dilatation had lasted 4 days before gastro-enterostomy took place Bloodgood's patient, who was reconvalescent after acute rheumatism and in whom dilatation was presumably caused by overloading of the stomach, died

two hours after the jejunostomy. Gastrostomy was performed on Appel's, Abbott's, Box and Wallace's, Brown's, Hoffmann's, Hanssen-Loberg's, Kehr's, Schilling's, Sommatin's and Watson and Wright's pa-Of these, Appel's and Box and tients Wallace's patients had acquired the dilatation after a blow on the abdomen; Hanssen-Loberg's and Sommarin's patients, after a more or less hearty meal, Kehr's and Schilling's, after gall-stone operation and gastro-enterostomy, respectively, and with Brown's patient, who up to the acute dilatation of the stomach had been quite well, no cause for the development of the illness could be traced. Appel, Box and Wallace, and Loberg incised, emptied, and closed the stomach and the abdominal wound. Hoffmann, Sommarin, and Schilling left a drainage tube in the incision of the stomach; the latter led the tube farther through the gastro-jejunal anastomosis, which was established before the onset of the acute gastric dilatation, and Brown stitched the edges of the incision in the stomach to those

TABLE IL-CASES TREATED BY OPERATION

D-Jarente 1	sex and		revious addition	Incidental cause		Operation	Result	_	Remarks
	Age	_			Ga	SEEDCOM	Death	_1_	the second compared and
ppel	-	Ol g	ood health	Abdominal mijery	_		Died 36 ho later		e stomach was inrised emptied and losed. Serood night new dilatation, bortly afterwards, death
Baillet	ilet M Erartscolated 3d d aft		3d day, suddenly ill after calé au hut	711	day gastro- jejunostorny	Died 12 ho	1	stric peristalsis Despite regular varuation with stomach tube, pro- ressive detenoration Cirrular fur low on the duodenum	
Bloodgood	M Reconvalueent III after		Ill after first real meal	Iter first real meal Jepune		Died 2 he later	ours G	astric peristalsis Arterio mesenteric compression	
Bor and	25 M		heumatism good health	Abdominal injury	G	istrotomy	Death	1 '	sparotomy for intestical obstruction The stomarh was incised emptied and closed
Wallace	t6	l	·		ļ.,		Death		
W H Brown	M 55	01	good health	Dilatstion unexplain- able	6	astrotomy	Desin		aparotomy for intestinal obstruction showed a "cyst' which was mened and drained. Post moriem the in- eised cyst proved to be the stomach
B Rohmson	╁	╁			6	aatro-jepanostomy	Cured	- 1	B R has reported a cure after gastro- jejunostomy" (Laffer)
Hochenegg	M	0	good health	Suddenly ill after hearty meal	1	aparotomy 3d day	Deed 3		he jejunum was fitted and the com- pressed duodenum relieved. After short relief new vomiting. Arterio- mesenteric compression.
Hoffmann	-\-	-	i good bealth	Severely all directly	1	Gastrostomy 6th day	Died 24 1 later		he stomach was messed empired, and drained
Jasop	r Hip-soint		Isp-sout resection	30th day euddeoly if	Laparotomy 34th day		Died few later	bours	The operation was only explorative
Kehr	- -	_	Gallstone	apple		Gastrostomy	Death	- 1	Died a daya later from hemorrhage
Karte	operation operation		Ill after big meal cate	Ill after big meal caten an haste		Ded 5th day		Evacuation by atomach tube proved impossible. For 3 days quite well Suddeo death from perforating gas tric necrosus.	
Hanssen- M Good		Good bealth	Ill one hour after beg meal esten in haste after exertion		Castroslomy 3 to 4 brs later	Died the	next	Two evacuations by stomach tube The etomach was then messed empired and closed. Death after short relief Excessive dulatation.	
Moorhead		F	Penneorrhaph osphorec tomy apper dectomy	1		Laparotomy Stomack emptied by tube	Cured		After the permeorrhap by a large tumor suddenly lormed in the abdominal cavity Laparotomy The tumor proved to be the distended stomach, which was emptied by tuba
Petat		-				Laparotomy	Cured		A kinking at the duodeno-jojunal june tion was relieved by the statching o jejunum to transverse mesorolon
Remond		_				Anterior gastro- jejunostomy	Death		
Schilling	_	F 15	Posterior gas	tro	_	3d day jejunal anas temosis, Eth day gastrostomy	Deed se	ith day	After the gastrostomy a drain was let through the gastro-jejunal anastome as into the jejunum
Sommari	n	F	Good health	Exremove amount of fruit Next day 3 tles of mineral wa	f raw bot-	Witnel's gastreston	Cured		
Templeton		F 28	Dyspeptic otherwise	Ill after a railway r	peal	Laparotomy	Cured		The greatly distended stomach emption itself during the operation without being invised or primped
Tschudy		F 47	healthy Kocher's pylorecto	my		Gastro-jejunostomy	Died :	6th day	Continual post-operative vomition Fifth day, gastro-jejucostomy N later gastrir symptoms Death from pneumonia
Wahlstr	ōm	M	Delicate	Suddenly all alter breaklast		Laparotomy 5th day	, , , , ,	oth day	The exposed stomach was emptied be trocar After the operation, regul- use of stomarh tube
Watsoo	_	1-			_	Gestrostomy	Died		
Wright	_	-1-	-		_	Gastrostomy	I Died		-

of the abdominal wound. Appel's patient died some 36 hours after the operation, under repeated dilatation, Brown's died 3 hours and Hoffmann's one day after the gastrostomy. Schilling's patient lived 8 days after the last operation under continual evacuation of the stomach with the tube. Sommarin's patient is the only one who was curred.

The 6 cases treated with laparotomy and without incision of the stomach underwent otherwise a different treatment. Jessop seems to have performed only an exploratory laparotomy, which a few hours later was followed by death. While the abdominal cavity was open. Moorhead (as also Borchhardt) emptied the stomach with a tube, Wahlstrom with trocar. Moorhead's patient recovered under continued treatment with the stomach tube; Wahlstrom's died after the lapse of 5 hours. Templeton lifted the stomach, the contents of which therewith spontaneously went over into the intestine; his patient recovered. Hochenegg relieved the duodeno-jejunal occlusion by lifting the upper jejunal loop, and seems to have confined himself thereto; his patient died 2 days after the operation under renewed dilatation and vomiting; Petit performed the same maneuver, but stitched the jejunum to the transverse mesocolon, and this seems to have prevented a new occlusion; the patient recovered. The satisfactory result in Moorhead's case is the more easily explainable in that the laparotomy which was performed took place under the same narcosis as that which is presumed to have occasioned the dilatation. Templeton's patient seems also to have come early under treatment. On the other band, Hochenegg's, Jessop's and Wahlstrom's fatally ending cases, all similar in so far as dilatation seems to have been occasioned by food, are operated first on the third, fourth, and fifth day of illness.

We thus see that of 23 operated cases 5 survived, 1 after gastro-enterostomy, 1 after gastro-enterostomy, 1 after gastrostomy, and 3 whose stomachs were emptited during a laparotomy. Even if the operative result in Korte's and Tschudy's cases is considered satisfactory, gastro-enterostomy does not appear in any flattering light. It seems reasonable to agree with Borchardt, who declares such an operation irrational.

In the commencement of the illness, while gastro-enterostomy could have a chance, one can attain a good result with simpler measures; and at a later stage of the illness, the difficult manipulation of the perhaps excessively distended stomach makes gastro-enterostomy a too serious operation for the collapsed patient. As Zade's, Schilling's and von Haberer's cases show, an acute dilatation of the stomach can both develop and continue notwithstanding an already performed gastroenterostomy. Gastrostomy, which one would consider much less dangerous, has in the rr cases collected here given even worse results than gastro-enterostomy. Lastly, as regards the performed laparotomies, they have, as might be expected, been somewhat more successful than the more radical operations, They have, however, proved themselves both unnecessary and dangerous The stomach can be emptied without laparotomy. The conclusion one comes to upon considering the result of all the operations performed is that success with operative measures, in a still higher degree than with any other treatment, depends on the stage of the illness in which the operation takes place

operation takes place
After the discouraging experience gained
one can foresee that operative treatment of
the acute dilatation of the stomach in the
future will rarely be employed. Byron
Robinson's suggestion of a duodeno-jejunal
anastomosis in front of the mesenteric vessels
and II. Abprecht's and Rosenthal's proposal of
shutting off the pelvis by uniting the sigmoid
flexure with the urinary bladder are hardly
more suited to rehabilitate operative meaures in the acute gastric dilatation than the
recommendation of stitching the root of the
mesentery to the transverse colon.

If we turn from operation to the treatment of acute dilatation of the stomach by postural treatment, things take at once a brighter outlook. First we meet with 26 cases in which the patient is turned completely over in bed. Among these is also included Borst patient, who was laid "semi-prone," on the right side. Of the others, the 23 base chiefly lain in Schmitzler's abdominal position; only 2, Engstrom's and Weinbrenner's, patients were laid in lace-chest and knee-ethow posi-

tion, respectively, which positions are suggested by Albrecht for the elevation of the pelvis.

The results are as follows: Of 26 treated patients, 2 are dead, Borchardt's and Nakahards. With the first the abdominal posture proved unfavorable, in the last it seems to have been effective.

The first, a female aged 17, was quite well until a hours after a nephropery, Almost as if she had not been operated. Then she collapsed suddenly, A smill explorative haparotomy was performed, which showed an enormous dilatation of the stomach. With the stomach tube 3th buckettil of fluid mixed with hile was emptied. The next morrang the patient was somewhat better and was half prome work and died a few hours later, 22 hours after the many control of the stomach was found distended right to the symphysics.

With Nakahara's patient, a female aged 29, phaptico-jumoutomy was performed June 19, 1998 June 11, severe vooling of greenish fluid after excutation of the stomach and subcutaneous and rectal salue infusion. The patient was laid partly on the abdomen, and partly on the right side. June 23, condition considerably better June 23, patient leit well, and clank milk, and soup All was now well until June 19, when the patient suddenly collapsed, bit and indestinal contents escaping through the wound. The patient deel June 25, Post-mortem the stomach showed only sight dilatation. The suture line between the hepstic duct and the summer showed only sight dilatation. The sturre line hetween the hepstic duct and the summer showed only sight dilatation. The sturre land silled the tupper part of the small intestion with blood.

In two cured cases, Hellendahl's and Kayser's, the abdominal position was without result. In the first of these cases it was abandoned after a short while on account of pain, and was tried the next day for only half an hour; three days later the gastric symptoms spontaneously ceased. The other case seems to bave been a dilatation of the stomach occasioned by meat-poisoning, where nine days elapsed without effect from any measure tried-stomach tube, various positions, etc. But when, on the tenth day, the patient was moved to another division, she became suddenly well for no known reason. A likewise sudden and unexplainable improvement was noted with Schilling's tube-treated patient after eight days in a dangerous condition.

In the other 22 cases, the abdominal posture has oftener, in the presence of threatening symptoms, and partly when longer treatment by the stomach tube had been without result, brought about a noticeable, often a surprising, effect, and occasioned the beginning of return to health (see Table III)

Of the 6 patients treated by side posture, one, Nakahara's is dead, the other 5 acured. Chavannaz's, Payer's and Walzberg's patients were laid on the right and Kelling's on the left side; on which side Nakahara's and Herrack's patients were placed is not mentioned. In Nakahara's fatal case side posture was tried only for a short time; in Herrick's and Kelling's cases, which recovered, it did not, at any rate, have a decided effect; in the 3 cases laid on the right side, however, the effect was satisfactory, in Walzberg's case even excellent, and as prompt as the abdominat position can produce it.

It will thus be seen that the abdominal posture in 22 of 26 cases has proved efficacious; in one case (Borchardt's) it seems to have done harm, and in 2 cases (Hellendahl's) and Kayser's) to have been without effect. Both the last named, bowever, are not typical cases of dilatation of the stomach, and thus can hardly be used as a basis for judging the value of the abdominal posture for the treatment. The effect of the side posture has been scarcely noticeable in 4 out of 6 cases; position on the right side has in 3 cases proved

very satisfactory (see Table IV). By the perusal of the history of the recorded cases one will find, however, that the favorable result of the abdominal posture in a case of acute gastric dilatation does not belong to the common round. It is, of course, not always alike conspicuous, but on the other hand the immediate result of the change of position has astonished one observer after another, and Weinbrenner's, Rosenthal's, H. Albrecht's and Landau's description of the equally complete and rapid change in the condition of the patient from the moment he was placed on the abdomen proves beyond doubt that one under these circumstances can meet with an effect which is most unusual. And so it is. In my second and third cases the abdominal posture was adopted rather

TABLE III - CASES TREATED BY ABDOMINAL POSTURE

Reference	Sex and Age	Previous condition	Dilitation when?	Stomach tube first used	Abdem posts when?	Res	ult bsb	Remarks
Schnitzler	1	Operat for inguinal hermi-	art day	1	3d day	Cu	td 13:	Serious condition In abdom posture,
P Maller	F 32	Cholecy s- tectomy	15t day	ad day	3d day	Cut	ed zoo	
Bäumler	M 36	Sciatica		z day after dilatation	a% days after delatation	Cut	rd zoo	Knee clhow position 3/ hour every other hour, meanwhile abdom posture as much as possible. The vocatine atopped at once. By new tubing atomach proved empty. Quick recovery.
Box	F 27	Ovanotemy	3d day	3d day	4th day	Cur	t po	Patent was placed 'sems prone 'on the right sade The effect was apparent at once
Borchardt	F 17	Nephropexy	ga bra after operation	Directly after dilatation	z day after delatation	Die	190.	Stomach tube meeried during explora- tive langeotomy 53 hm after the orphropery. In abdominal posture ment day patient not 'freedroyant's worse and deed few bours later.
Robson	F 58	Ovariotomy	20 hrs. later		15 brs. after operation	Cure	d 1901	herself relieved almost immediately
H Albrecht	F 37	Colporthaphy, ovariotomy	336 days later	Directly after dilutation	Shortly after dilatation	Cure	d 1907	Suddenly ill after excess to fluids. Re- ault of abdominal posture prompt and surprising. Patient maintained it with pleasure
Rayset	F 40	Mant possoning	4 hm after the meal	A to 5 lars after dilatation	5th day after delatation	Curr	i Igoš	Stomarh tuba and different rhanges of posture (abdominal, kase-thest elevated pelves) without affect. Tenth day of illness patient was moved to souther division. Sudden improvement.
Landau	F 48	Hystaro- myomectomy	3d day	3d day	6th day	Care	1908	In abdom, posture instantaneous sed in the highest defree surprising change of general condition. Sudden relief and arute recovery from an apparently applicas state.
Landau	Ē					Cure	1008	Cured by abdominal posture alike quickly as previous east?
Lightenstein	F 43	Laparotomy etc.	9th day	10th day	zoth day	Cure	1908	Suddanly ill after a bottle of Apolinaris for abdominal posture, relieved at more but leable. Next day well
NakaBara	F 19	Hepatico- jejunostomy	Ist day	ad day	24 day	Died	1908	Is abdom posture all west well till più day. Then intestigal hemorrhage and fistula. Death 15th day.
Rosenthal	F 37	Hystero-myo- mectomy	3d day	4th day	stb day	Cure	1908	Suddenly and severely ill after 3 % later ander Most straking effect of ab- domainal posture ' It seems incred ible that an illness in x hour can improve so'
Baillet	F 50	Ovariotomy	sd day	sth day	8th day	Cured	1900	In abdominal posture quick recovery from a mruncing condition
Delagendre	91 91	Hermotomy	16 hrs later	Failed	ag hri after operation	Cured	1909	The utterly exhausted patient feels very comfortable in abdominal posture and improves hourly. After lying prose the whole might his aspect is com- pletely changed.
Engström	F 69	Ovariotomy	3% days later	5th day	5th day	Cured	1900	Ill after heavy supper For so somules placed on knees and chest with instan- taneous relief, then on the right side
Haberet	F	Gastro- enterostomy	aith day	23th day	13th day	Cured	1900	Gastric lavage without effect such was at once produced by abdominal posture
Theilbaber	33	Sectio Cerarea	3d day	3d đay	536 days efter operation	Cared	1900	The violent vocation at opped promptly in abdomial posture Patient in proved hourly remained profile for 16 hours and liked the position

TABLE III (CONTINUED) -CASES TREATED BY ABDOMINAL POSTURE

		INDUC III	(CO THE CED)	O LUBO Z-				
Reference	Sex and Age	Previous condition	Dilatation when?	Stomach tube first used	Abdem posture	Result	lan 1	Remarks
Weinbrenner	F 37	Ventrofixatio uteri	zst day	12 hrs after dilatation	36 les after delatation	Cured	1900	In a state of impending danger ab- dominal posture gave instant relief and gradual improvement. Patient instated upon remaining prone, abe felt well thus
Hellendabl	Γ 24	Salpingotomy		Darectly after dilatation		Cured	1910	Patient could not endure abdominal posture It was again tried for 1/2 hour the next day
Payer	F #3	Hysterectomy after berth	4th day	4th day	5th day	Cured	1010	Patient was quickly relieved by abdom- inal posture alternating with knee- chest position
Borchgre- viok	F 53	Cholecyster- tomy	3d day	8 hrs after dilatation	ass days after dilatation	Cured	107.5	Ill after much fluid Gastric lavage twice daily for a days without effect Patient, who appeared to be dying, improved as by a miracle in abdom- inal posture
Borebgre Vink	F 27	Salpingotomy	ad day	24 hrs after dilatation	30 hrs efter dilatation	Cured	1918	Ill after much fluid. The severe pain and vomiting were at once relieved by abdominal posture, which the patient washed to continue.
Borchere-	31 43	Laparotomy	ad day	23 hrs after delatation	36 hrs after dilatation	Dated	гогя	The symptoms of acute fastric dilata- tion vanished promptly in abdominal posture. Fastrict was well for 15 days, when he was takes all and died 7 days later from pneumonia.
Borchgre- vank	N.	Appendicitis operations	19th day	Not used	60 hrs after dilatation	Cured	1912	Laparotomy without effect, 52 hrs later prone posture brought immediate rollel Patient, for a daya nearly wild from pasa, became quiet and happy
Borchere- Vink	VI 65	Cholecystrin, not operated	Shortly after the first food taken	Not used	ra hes after dulatatum	Cured	6912	Abdominal posture had a striking effect

early. Both patients were certainly in a serious condition, but the illness had not reached an extreme degree. The effect of the prone position was in both cases prompt and striking. My first patient, on the other hand, who was placed in abdominal posture about 60 hours after the onset of the dilatation, and at a moment when she seemed to be past recovery, was cured in the most dramatic manner. The same was experienced in my case No. IV, treated by Dr. Bull. I have often wondered whether I have ever witnessed a sudden and continued therapeutic effect which can compare with that which the abdominal posture brought about in my first case But to this I have always had to reply in the negative. According to my experience, even Landau's comparison with the effect of the reduction of a strangulated hernia is insuffitient. Herein I imagine everyone who has witnessed the effect of the abdominal posture in a desperate case of acute dilatation of the stomach will agree. When Braun and Seidel write thus: "Von der Bauch oder KnieEllenbogenlage mochten wir meist nicht viel erwarten," it only proves their non-experience of such an event. The unsatisfactory effect of the abdominal position in Borchardt's case, the author himself, in contrast to others, considers of no importance, but finds the result explained by too late diagnosis. In Bull's first case, in nearly every respect a parallel to Borchardt's, change to a prone position had an effect as striking as every

ETIOLOGY

Although my article was originally intended only to comprise the treatment, I cannot neglect to mention the greatly discussed etiology of the acute gastric dilatation. The observation of the instantaneous effect of the abdominal posture, which has much of the character of an experiment, compels one involuntarily to a consideration of the etiological question based on personal experiences, and to the study of the literature on the topic. It appears to me that a functional disturbance like acute dilatation of the stomach is better explained

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Reference	Set and Age	Pitelesi tondina	D'atulos when'	fra cel	Seleparane first trad	f.,,	Ful.	Broutu
Kelling	1.0	Matter jacket applied	g days later	g attend	1 2::10	1 400	(70)	13 6 hours after log faster. Pixel in the liet in a Telephonest more contractly guilty hours.
Walsterg	1.	Fundamental Laparetorny	35 hours later	Et Sangle e tet Espisiens	::''' 	1 4163	12 1	I begate gentre lange teks da'y pa- turit gere ware god been. I dat di Lat't take just to pear t and mu- bate.
Herra k	72	Parumania	glb day	t for after dutte um	1 6+11 r 2101.		1241	Hand three or 't be that to be been been been been been been been
Chavannus	10	At-Lowersh Hyderectomy	oth day	La brauer a ten Latatoria	112.55	٠ ١	1,05	Rutt wie pulse pit se ent to to ment of
114414	F.	I to team of fetamen trans	16th day	16th day	4 18 °45	15	typi	de post one of feet to market and a chart of all bott for mark death dirting the first game larget
Paper	34	Approvisitie operation	ridy		1 00111 07	1 44	141	The deposition to division cou- only 6 to the treams of the share and due to

by clinical observations than by the numerous experiments on animals and studies on corp-es

The principal hypotheses to explain the development of the acute dilatation of the

stomach are the following:

1. Paralysis of the stomach. This is the oldest and most generally accepted explana tion It is first asserted by Brinton' In 1850 and later maintained up to this time, and last with great emphasis, by Braun and Seidel in their clinical and experimental investigations from 1907.

2 Primary mechanical occlusion of the duodenum with secondary dilatation of the stomach. The compression of the duodenum under the mesentery was described by Kundrat as a special form of high strangulation, and its significance as a primary cause

supported by P. Müller.

3. Primary gastric dilatation, be it by neuroor musculo paresis, and secondary mechanical occlusion of the duodenum, either (a) by the distended stomach's direct pressure on the duodenum in its passage over the spine (Box and Wallace) or (b) by a secondary arteriomesenteric compression brought about by the distended stomach's pressure on the small intestine.

Several other hypotheses have besides been

I Brinton Lectures on doesses of the storach Kundrat Wien med Wchosche, 1891, no. 2.

suggested which have met with less face. Albrecht taknard and Robinson have considered a pre existing chronic dilutation of the stomach to be the primary factor. Pagge and later Morns saw in castric hypersecretion, and Pepper and Stengelin a stastic occlusion of pylorus, the determining cause; while Kelling suggested that a samultaneous valcular kinking of the palorus and cardia forms the origin of the dilatation. The existence of a pyloric occlusion is disproved however, by the presence of lule in the comited matter, as well as by the fact that post mortem a nearly constant distention of the duodenum is found, a cardia occlusion is also disproved by the fact that comiting occurs in most cases. I'm the formation of a cardial valve there is no other clinical support than you Heril's observation afore

mentioned The view that the whole illness depends upon paralysis of the stomach is supported by the analogy we have in the paralyzed intestine in peritoritis. It has besides found much support in a number of experimental results. Among these, most weight has been laid on the following facts. Section of both the pneumogastric nerves in the dog leads as the only factor to a considerable dilatation of the stomath (Carion and Ilallion); the animals lose thereby their capability for reflex vomiting, while the direct influence of apomorphin on the vomiting center is still undiminished. The power of vomiting disappears altogether

A numera to said south or Committee, 1994, St. E. 4 6 Kayser awerts, supported by his second case that the accordance of the doubleaut data was also place in its lower but in the super-part. A doublead himbing in Kausch's first case also had its seat in the same place.

by division of the spinal cord above the sixth dorsal vertebra (Braun and Seidel). analogy with some conditions in the acute dilatation of the stomach in mankind is presumed to have been found in the following observation of Kelling and Braun and Seidel. With dogs who have got better after gastrotomy, retching and vomiting prevent dilatation of the stomach as a result of overloading; under narcosis, however, one can distend the dog's stomach to the utmost without vomiting occurring. The fact that the dog upon awaking from the narcosis invariably empties its stomach by vomiting, seems to prove that the result of these experiments cannot be brought to bear on the post-operative dilatation of the stomach in the human being.

Among clinical conditions which have been taken as evidence in favor of the paralysis theory is the appearance of the gastric dilatation in connection with disorders of the spine, illnesses of the nervous system, and severe injuries, but above all its dependence on the paralyzing influence of narcosis. The supporters of the paralysis hypothesis consider the mechanical moments of no importance, and look upon the arterio-mesenteric compression as an accidental find and an unessential result of the pressure of the paralyzed and distended stomach (Braum and Seidel).

The arterio-mesenteric compression was by others taken as an equally plausible explanation of the extraordinary dilatation of the stomach, as any intestinal obstruction makes for the distention of the intestine above it. The oftener the compression under the mesentery was observed, the more attention was paid to it, all the more so since those who at the post-mortem sught for it in most cases found it, pointing to a frequency in occurrence which seemed to exclude the possibility of anything accidents.

Attention has later been drawn by von Haberer 1 and Ekehorn 2 to a chronic dilatation of the stomach and duodenum as a result of mesenteric occlusion at the duodenojejunal junction caused by traction on the mesentery from intestinal adhesions. Finally the mechanical theory won much support by the striking and often more or less instantaneous influence of the abdominal posture

neous influence of the abdominal posture. It was already clear to the first advocates of the mechanical hypothesis that the essential condition for the arterio-mesenteric compression lies in a sufficiently strong pull downward on the mesentery of the small intestine. This traction could be executed by the small intestine lying in the pelvis. To get there the intestine must be empty, and in order to perform the pulling it must have (a fact to which P. Muller first called attention) a fairly long mesentery -- long enough to permit the bowel to reach down into the pelvis, but not so long that the bowel may rest on the pelvic floor. Glenard drew attention to the fact that the weight of the empty small intestine was about 500 gr., and by numerous experiments on cadavers. Albrecht. Glenard, Conner and others have shown that such a weight on the mesentery, at any rate in many cases, occasions a considerable arterio mesenteric compression of the duodenum Glenard states, on the other hand, that this compression is to a certain extent physiological and is present especially after meals, and that the dragging in the living individual need not be very considerable to bring about the occlusion of the duodenum. There is, however, another question to be answered Why does the small intestine collapse, and why does it sink down in the pelvis to exercise the primary arterio mesenteric tightening in Kundrat-Albrecht's meaning? On this point, Albrecht, the theory's chief champion, has no answer. He presumes that earlier there probably has existed an ectasy of the stomach, and it will thus "durch eine akute Steigerung der Dilatation, eine rasche Fullung des erweiterten Magens, namentlich auch durch eine Aenderung der Lagerung des ganzen Korpers - passive Ruckenlage, daher das plotzliche Einsetzen des Ileus nach Narcose und Operation - zu Herabsinken des unteren Teiles des Magens ins Becken kommen," he is, as will be seen, tempted to resort to gastric difatation as the determining factor, but as this is impossible without the theory

¹Loc cit among collected references

² Ekchern Fall von enormer Dilatation des Magens und Dundenums
von angeborenem atternomesenternalem Ursprung Nord med Arch.

1004

being done away with, his argumentation lacks conviction. Rosenthal sees in the fact that the dilatation often develops so long after the operation that the chloroform or ether have long vanished from the system, an evidence against a primary paralysis due to narcosis, and for the supposition that the mechanical condition must be the primary cause of the gastric dilatation. As arguments to the same end, Landau mentions absence of gastric symptoms before the onset of acute ileus, and the incongruity of the effect of the abdominal posture when the stomach is paralyzed However, both the arterio-mesenteric compression and the dilatation of the stomach are, as von Haberer remarks, anatomically founded facts, and there are many who doubt as little the existence of a primary duodenal obstruction with secondary gastric distention, as the occurrence of a primary dilatation of the stomach with occlusion of the duodenum as an eventual sequel Among these, H Albrecht, Beck, Bloodgood, Conner, von Haberer, Kausch and Weinbrenner may be mentioned.

It is of course impossible to prove that a duodenal occlusion in a single instance cannot be the primary cause of gastric dilatation But it appears that such a supposition is not Among other things, an very probable obstruction of the duodenum, with which we now and then meet, does not either anatomically or symptomatically create any parallel to the acute dilatation of the stomach We are acquainted with many cases of acute duodenal obstruction where, for instance, one or more gall-stones have ulcerated through the gall-bladder into the duodenum and blocked it. In such cases we notice the absence both of gastric ectasy and the clinical picture of the acute dilatation of the stomach. A certain dilatation of the stomach, but only in a slight degree, is on the other hand noticed in many cases, where a chronic cholecystitis has caused a periduodenal inflammation with a successively developed stenosis of the intestine neither case do we get the picture of the acute dilatation of the stomach, but that of pyloric stenosis with its relative comfort after the somiting.1 Neither does dilatation of the stomach belong to the regular picture of the high jejunal obstruction. On the whole we are entitled to say that a gastric distention, moderate in comparison with the acute dilatation of the stomach, is usually connected with high intestinal obstruction of long, but not when it is of short, duration. In support of this statement, I mention the following case of high jejunal strangulation which has been treated in our hospital

A L, female, aged 47, during the last a years bad suffered from gall stone colic and a ventral hernia On February 23, 1911, at Diakonhjemmet, cholecystostomy, radical operation of the hernia, and appendicectomy were performed

reb 24 - The patient during the first 24 hours was somewhat exhausted, but condition otherwise quite satisfactory Through the drain, 300 ccm

bile escaped.

Feb 26 - Temp hatherto normal Yesterday evening thin greenish gastric contents were comited With the stomach tube nothing could be evacuated The condition of the patient, however, is still fairly good I latus have been passed this morning

feb 27 - In the last 3 days no bile escaped through the drain. The patient's former comfort during the night has been interrupted by headache and abdominal pain. Slight jaundice.

Feb 28 - 50 to 100 ccm, but has again escaped.

The patient feels better March 1 - Temp 37 4, 37-7, P. 124 The abdomen to the left above the navel, is distended but not tender The patient has fallen off considerably. With the stomach tube 200 ccm black, thin, fluid is emptied with subjective relief, but the patient

sank noticeably and died 13/2 hours later. Post-mortem A horizontal part of the duodenum does not exist, its descending part runs through an opening in the mesocolon to the right of the spine Through this opening a loop of the lopmost part of the jejunum 8 cm long has pushed itself up beside the duodenum and been strangulated there A slight furrow is visible on both ends of the loop strangulated bowel is strongly distended and has compressed both the duodenum and the common

duct The stomach is empty and of normal size or only slightly distended

Both in obstruction by gall stones and with a high strangulation, as in the foregoing case, the occlusion of the intestine is, however, accompanied by a complicating process, i.e., the perforation of the gall bladder and duodenum, and secondly the strangulation of a jejunal loop. It is reasonable to suppose that

Il refer elsewhern to a case of acute duodenal obstruction caused by a gallstone Borchgrevink Complicated gallstone cases, Norsk Mag I Largersdensk 2018

the picture of the illness will thereby attain a severer appearance than by a simple compression of the duodenum. The most perfect parallel to this we find in a high jejunal occlusion produced by compressing adhesions, as in the following case.

A F., male, aged 60, sent to Diakonhjemmet December 3, 1000, for chronic dilatation of the stomach. December 7, posterior gastro-jejunostomy was performed on account of a stenosis caused by a duodenal ulcer. After being discharged from the hospital on January 8, 1910, the patient was quite well until March 7, 1010, when vomiting suddenly commenced reappearing after every meal patient lost flesh rapidly, and once more entered Diakonhjemmet March 21, 1919. The symptoms of a pyloric stenosis were again recognized. In the early morning the stomach was filled with fermenting material, the evacuation of which with the stomach tube gave immediate relief. Food and drink caused vomiting. The stomach extended downward to the umbilious. The patient felt weak but preferred, when the stomach had been emptied, to be out of bed

March 23, laparotomy was performed A part of the fightumy 7 to 8 cm. below the anastomous was lound adherent to the lower end of the abdominal sear. The transverse colon was rading on the internal sear of the transverse colon was rading on the kindleg at the site of the adherion. The stomach was somehout ditented, but less so than at the operation 3½ months ago. By separation of the adherions the givinnum was freed, and as the gastro-lejunal anastomous proved to be in order, the adhorimatic activy was closed. The patient was abdominal cavity was closed. The patient was discharged April 13, 1910, and has often sireet, the first of the patient was considered and the size of the patient was considered and the size of the patient was followed by the patient was supported by the patient was supported to the patient was supported by the patient was su

My observations are thus congruent with Arhausen's in regard to occlusion of the intestine below a gastro-anastomosis, of which he says: "In beiden Fallen war also trotz kompletten hochsitzenden Darmersehlusses nicht ein klinisches Bild entstanden, das dem der ospanannten acuten Masendilatation irrend-

wie an die Seite gesetzt werden konnte "1

Other circumstances seem to witness against a primary intestinal obstruction as a cause of an acute dilatation of the stomach, for instance, both the rapid course of this illness and the quickness with which the dilatation develops. We have no parallel to it either in intestinal obstruction by linking or compression of any segment of the bowel In the

majority of the non-treated and fatal cases of my collection, death occurred within two days after the first symptoms of the acute dilatation, and in most of these cases the stomach was found to extend towards the symphysis. In Hanssen-Loberg's operated case the stomach, even after the lapse of 3 to 4 hours, was distended to the lowest part of the abdominal cavity It would also hardly be reasonable to conclude that the quickly appearing dilatation after overloading of the stomach in people in good health did not date from the overloading's direct influence on the stomach. but occurred as a result of duodenal compression. Borchardt's argument against primary compression - that a stomach which cannot overcome the resistance of a compressed duodenum thereby proves its atony - appears also to me to be of much weight. On the other hand Rosenthal's interpretation of the late appearance of the dilatation as an evidence against a post-operative paralysis due to the narcosis is based on a double misapprehension. He assumes firstly that the acutely distended stomach must be wholly paralyzed, what several observations of gastric peristalsis prove is not the case; secondly, he totally disregards the possibility that incidental causes, independent of time, as we shall see later, can bring the dilatation to develop in an enfectiled or even in a more or less healthy

stomach. The influence of a mechanical factor on the acute dilatation of the stomach is, all the same, difficult to ignore. There is too much at the later stage of the illness which tells of the presence of a real obstruction. The often slight or deficient effect of the treatment with the stomach tube, to which I have formerly called attention, seems for instance difficult to explain, il it were not that the contents of the stomach remaining alter each use of the tube were in some way or other prevented from going over into the intestine. prompt result of the abdominal posture supervening under these circumstances proves that this obstacle is of a mechanical nature. In all superfluity, the hindrance has been seen in a large number of cases. Among such may first be mentioned Kayser's and Kausch's observations of a kink of the first part of the

duodenum, and finally the 29 cases mentioned under pathological anatomy, in which an occlusion at the duodeno-jejunal junction is proved by operation or post-mortem.

That a duodenal occlusion, according to Box and Wallace's description, can sometimes be occasioned by the stomach's pressure on the duodenum where it crosses the spine, is certain enough, and with an excessive lordosis, as in Hanssen's Case 7, perfectly clear. Conner has also proved, by investigations on cadavers, that it can sometimes appear with a normal form of the spine, and the lower the duodenum crosses it the easier. But this form of compression seems to be rate, as it has been proved in numerous carefully examined case, that the large stomach exercted absolutely no pressure on the horizontal part of the duo-

One must seek the secondary obstruction in the condition which without doubt is oftenest observed, the arterio mesenteric compression And when acute dilatation of the stomach is first established, all presumed causes, such as an appropriately long mesentery, the small intestine hanging in the pelvis, etc., need scarcely be present in order that the necessary traction on the mesentery can arise. It seems more likely that the heavy and increasing stomach both empties the small Intestine and drives it downward and holds it in the pelvis or in the lower part of the abdominal cavity That a stronger dragging must be excrted on the mesentery in this way than by the mere weight of the small intestine seems probable This is, of course, only a hypothesis, but it has so much in its favour that it scarcely has met with opposition And the opinion that the arterio mesenteric compression is a secon dary phenomenon, and as a rule called forth by the pressure of the already distended stomach, has by degrees won more and more followers, among whom may be named Baumler, Borchardt, Conner, von Herff, Kausch, Laffer, Steida, Thoma and Zade Bull's carefully observed case (my case 4) gains under these circumstances special interest. It is, so far as I know, the first observation of mesenteric compression under circumstances where the true pelvis has been blocked for the small intestine, and where no other explanation for the compression is present than pressure and dragging from an only slightly distended stomach. The value of the observation is further increased by the fact that it was done in the bring subject, and that the result of the treatment supports to supposed importance both of the mesenteric compression and the pressure from the stomach.

If there is reason to suppose that the acute dilatation of the stomach, at any rate in its pure form, is primary, it does not follow that the theory of its origin by paralysis of the gastric nerve apparatus necessarily must be accepted. It must be admitted that a degeneration of the muscular coat of the stomach, as slight in the acute as the chronic dilatation, has hitherto been observed microscopically; but on the other hand the observation of nervous disturbances in the acutely distended stomach appear more as a postulate than a fact The connection between gastric dilatation and nervous disorder are, in the few known cases of the kind, doubtful enough. The right to transfer the experimental results to the human being are far from indisputable And finally, we are absolutely without proof of a disease in the nerves of the stomach, first and foremost the nacumogastric, in a case of acute dilatation The two facts - that a person in good health can be struck as by hebtning by this illness; and that under correct treatment regularly, as for instance in my first 5 cases, it is completely cured within a few days - makes it more than difficult to assume that one has had to deal with a nerve

disease in the ordinary sense.

There is one factor in the origin of acute dilatation which has certainly been noticed, but
lass not received such attention as Braun and
Scidel give it, this is the effect of food and
drink. This seems clear enough where a
person in more or less good health simply eats
himself to the illness, but it seems likely that
the same factor also plays an important part
in the case of patients lying in bed. It is thus
scarcely accidental that there are among the
patients no small number of reconvalectoris,
or that the illness in post-operative cases
ofteness appears about the third day, in other
words, at a time when the patient's wish for

food begins to make itself felt. By reading through the history of the cases in my collection I have succeeded in finding, in addition to the 10 more or less healthy subjects who became ill after excessive amounts of food or fluids, 32 cases where the onset of the illness was connected with a meal or ingesta of another kind, oftenest too much drinking with those upon whom laparotomy was performed, H. Albrecht, Albu, Baillet, Baumler, Bloodgood (2 cases), Borchgrevink (3 cases), Braun and Seidel (5 cases), Engstrom (2 cases), Hanssen (No. 7), Ewald Heine, Kayser (2 cases), Kelling, Kirch, Laffer, Lichtenstein, Neck (3 cases), Payer (2 cases), Rosenthal, Stewart, and Thoma. There are thus, among 144 patients, 42 with whom the history includes a hint that ingesta can have been an effective incidental cause. Probably this has oftener been the case; for in post operative cases above all a careful examination of both patient and nurse is often necessary before it is discovered that the prohibition against imprudence in drinking has been most grossly ignored. It was so in Braun and Scidel's first five cases, and in a high degree with my first and second patient. I repeat in shortened form some of the most typical histories from the above mentioned post-operative cases in which error in diet caused the outbreak of the illness It will be seen that sometimes one overloading of the stomach after the other must occur to provoke the severe picture of dilatation

On H. Albrecht's 37 year-old patient, amputation of the cervix uters, colporthaphia ant and post, and ovariotomy were performed, April 27, 1906

Severe post-operative vomiting, much thirst, is supplied with little fluid through the mouth

April 28 - Condition good, P 78, T 36 8 Two vomitings.

April 20 - Condition not so good Feeling of oppression in the epigastrium but no tenderness Several vomitings, severe thirst In the evening the patient had succeeded in obtaining plenty to drink. and before midnight the symptoms of dilatation appeared in full vigor

Baillet's patient was a somewhat nervous 18-yearold boy who had never noticed any irregularities of the stomach. November 7, 1905, exarticulation of the arm on account of sarcoma was performed The first day all went well, the second day the patient had a good spontaneous action of the bowels and drank "eau de Vals" and a cup of bouillon, the

third day likewise he felt well, was hungry, and asked for food, when he was given a cup of "café au lait." "Quelques instants après avoir pris ce lait, il a un comissement excessivement abondant sentant très mauvais. A partir de ce moment il ne cesse pas de vomir et de se plaindre d'un douleur au creux epigastrique "

Engstróm's patient No 1 was a woman 45 years old, of medium health, who had occasionally noticed some weight in the epigastrium after meals March 28 a supravaginal bysterectomy was performed. Danne the first two days the patient felt quite well. After a substantial dinner on the third day she felt some distention of the epigastrium. On the morning of the fourth day she felt well and ate a good breakfast and dinner with surprising appetite quarters of an hour later the illness appears Notwithstanding the emptying of 2 litres of contents of the stomach with the tube, death occurred after less than 24 hours' illness. As the post-mortem shows it is to be attributed to acute dilatation of the stomach accompanied by mesenterie compression of the duodenum

In Engstrom's Case 2 ovariotomy was performed on a woman 60 years old. During the first two days, complete comfort The second evening the patient ate with good appetite milk, sandwiches, egg, and some gruel In the course of the night of the third day some vomiting. On the morning of the fourth day she felt better, ate an egg and drank a little milk. In the morning she drank a bottle of mineral water, whereupon the acute dilatation of the stomach set th

Upon Rosenthal's patient No 1, a 37-year-old woman who had bitherto always enjoyed good health abdominal hystero-myomectomy was per-formed on January 8, 1903 During the first three days all was well, and the function of the bowels was It 8 A M on the fourth day the patient drank 34 litre coffee surreptitiously. As early as 11 A M the scene was changed - severe pains in the epigastrium, the face like ashes. P. 200. At 5 P M., P 150, violent vomiting and collapse, whereupon a very severe picture of acute dilatation of the stomach developed, which disappeared under treatment by abdominal posture the sixth day after the operation.

But excess in eating and drinking is not always necessary to overfill the stomach. An almost daily experience shows us how retained contents of the stomach, especially after a laparotomy, can be multiplied. This probably occurs partly by decomposition, and therewith accompanying gas development, partly by the irritation of the stagnated contents, which causes hypersecretion. Braun and Seidel express their opinion of the significance of this state of things in the following words: "Narcose und operativer Eingriff bedingen nun zunächst nicht die Dilatation selbst, sondern nur die motorische Insufficienz und damit die Disposition zur Dilatation. Damit die motorische Insufficienz zur Dilatation fuhrt, ist noch eine Ueberfullung des Magens mit flüssigen oder festen Massen bezw. eine Auftreibung mit Gasen wie im Experiment notwendig," It also appears to one that the same authors have found an appropriate expression when they declare the primary cause of acute dilatation of the stomach to be a disproportion between working capacity and the work required. Popularly expressed. One can demand too much, even of a stomach, or one may say with Laache "when one thinks of all the injury to which a stomach is exposed in the course of time, one must be more surpised that its wall holds in the majority of cases, than that its muscular coat sometimes gives way "

On the other hand, one is probably on unsale ground when one concludes that the stomach's failure in working power is provoked by special central or peripheral disturbances of the nervous system of which the stomach becomes the only or special prey There is nothing which suggests, let alone proves, that the stomach in usual cases of acute gastric dilatation has received more than its share of the whole organism's debilitation in functions When the stomach, after narcosis or other enervating conditions, is suddenly distended, it seems to conform more reasonably with clinical observations to presume that this occurs, not because the stomach in a special degree is weakened, but because it is an organ of which, under these circumstances, there can often be required too much.

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CERVICAL DECIDUA:

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UR present conception of the decidua began in July, 1842, when Coste pre sented a report to the Paris Academy of Sciences entitled . Origine de Le Cadinque, stating that there was no evidence to confirm the theories of John Hunter and Matthew Baillie concerning the formation of this struc-He held, on the contrary that the cubal and cervical ordices in the uterior e truty were patent at the time the egg entered the uterus. and claimed that the membrane in one-tion was not an exudate but resulted from a characteristic transformation of the preexisting uterine mucosa. This work of Coste was followed four years later by reports of a similar tenor by Weber in Germans and Sharpey in England It was reserved how ever, for Robin, in 1848 to he t describe the finer histological structure of the decidua and to show that each element had its analogue in the endometrum. The better known work of Hegar and Majer dates from 1862 vet it was not until after the appearance of Fried lander's article in 1870 and the hundrat and Engelmann reports in 1873 that this doctrine obtained general acceptance

At the present time the uterine deciding is considered to form only as a result of preg nancy. It is believed to be absolutely essential to all uterine pregnancies, since it has been found in all such early specimens. where it would appear that it formed a radius for the reception and development of the ovum, and takes part sub-equently in the formation of the placenta. The teaching of Heinricius, in 1891, that the membrane was intimately concerned in the nourishment of the ovum during the weeks prior to the establishment of the feetal circulation in the chorion, has received much corroboration from investigators of the same structures in lower animals, most of whom were attracted to it by study of the fate of the glycogen. Others, as Rossi Doria, believe that it also constitutes a barrier to the entrance of

syncytium into the maternal body, while Charrin and Goupil (1905) have advanced the theory that it acts as a lymphatic gland the filtering some of the toxic substances passing toward the fectus.

With our better understanding of the vausual types of pregnancy, there are described many variations in the intentity of the decidual reaction in the uterus. The large thick decidua observed in the non-pregnant side of a double uterus has long been known, as has the similar condition in the uterus with a pregnant and rudimentary horn. Governed targely by such observations, Pozzi and Caseaux stated that the intensity of the decid ual reaction in the uterus was dependent on the provinity of the ovum. This view has not obtained wide acceptance, however, although the hypertrophy of uterine muscle would appear to be so influenced. Varying conditions of uterine decidua are seen in tubal pregnancies Thus the uterus is seldom the ste of marked decidual reaction in early tubal abortion, as it is far more and to present only in localized areas Indeed it occurs as a welldeveloped layer with compact and spong divisions only in such cases as have passed the second month, at which time the decidus of uterine pregnancy would have nearly reached the height of its development. over, the papillary proliferation in the glands, deemed characteristic of normal pregnancy by Opatz, are absent in the uterine decidua of tubal pregnancy (Werth). Less is known of the uterine reaction in ovarian gestation, while none of the few cases accepted as true instances of abdominal pregnancy present detailed study of the uterine content.

As carly as 1891. Bland Sutton had drawn attention to the fact that the decidual reaction in the tube in tubal gestation was not nearly as extensive as has been believed. This view received the support of Futh and Griffiths a few years later, while others, as Killing. Aschoff, and Kreisch, frankly stated them

selves as skeptical of the existence of decidua in certain cases of this category, and claimed that cells frequently described as decidual were in reality of feetal origin. Although the nihilistic views of these authors have not obtained much acceptance, certain it is that the decidual reaction at the site of tubal pregnancies may appear only in limited extent. There is, however, always the possibility of a larger and earlier area of reaction which has later become decimated by various degenerations. The presence of decidua in tubal pregnancy has been frequently demonstrated, not only in the pregnant tube but also in its fellow of the opposite side, limited for the most part to the tips of the mucosa decidua reflexa, or more properly capsular membrane, in consequence may contain but few or no decidual cells. A definite decidua is lacking in ovarian pregnancies, although the possibility of decidual cell formation must be admitted in the first case of Webster.

The decidual reaction was long supposed to be limited to the uterus and tubes Gradually, however, other sites were described until

we find it recorded.

1. In the mucosa of the uterine body dur-

ing ectopic pregnancy
2. In the mucosa of uterine adenomyomata

during uterine pregnancy 3. In the cervix.

4. On the posterior uterine wall, or in the cul-de-sac beneath the uterine peritoneum

- 5. In the non-pregnant tube during ectopic pregnancy and in both tubes during uterine pregnancy.
 - 6. In the ovaries and parovarian cysts.
 - In the omentum.
 - 8. In the appendix.
 - In the serosa of the intestine
 In peritoneal adhesions.

It is of interest to recall that normal pregnancy is not essential for the production of decidua. The structure has been seen with hydatid mole pregnancy and also with chorioepithelioma, although in the latter instance there is always the question whether the decidua was really not preserved from the former pregnancy

It has long been recognized that the cervix may show decidual change, although the majority of texts deny the possibility and voice the opinion of Gebhart that the internal os represents the lower limit of decidual formation. For the most part the positive cases quoted below were recorded either in articles devoted to the discussion of the origin of the lower uterine segment or else in consideration of the production of placenta pravia centralis from primary implantation of the egg in the region of the internal os. The majority of these observations are therefore in association with cases of placenta pravia.

Decidual tissue in the cervix was demonstrated by Bayer in the folds of the arbor vitæ in two cases This observation, recorded in 1885 in an article on "The Physiology and Pathology of the Uterus," excited but little comment, possibly because it did not come to general notice. Nor did the report of Ahlfeld of a similar condition in the upper cervix of a placenta prævia arouse more interest six years later The majority of case reports credit v Weiss with being the first to control such observation with specimens, although it is clear that Weiss's report in 1897 is antedated 12 years by Bayer's observations. In Weiss's case the cervical mucosa appears to have furnished at least a part of the decidual serotina, which is surmounted by a firmly attached placenta prævia. Keilmann, five weeks later in the same year, reported a similar condition, although his deductions were based only on clinical findings and were not controlled by

specimens. Von Franque in 1897 presented two cases, one of which was associated with placenta prævia at the tenth month of pregnancy, The specimen was obtained from a VIII-para 41/2 hours after delivery. The placenta was on the anterior uterine wall Sections from the posterior cervical wall, 3 cm. from the external os, showed many decidual tells, between which were thin walled blood-vessels. The sections taken over an area 2 cm long contained many developed glands containing unchanged high cylindrical epithelium. His second case is of greater interest, as it showed decidual cells in the cervix of a six months' pregnancy with a normally implanted placenta. The space between the decidua of the body and the cervix proper was unchanged

for 3 to 4 mm., below which on the crest of the arbor vitæ were seen areas of typical decidual cells, even as far down as the external os. The cervix appeared very vascular.

Ponfick in r809 presented two cases associated with cervical placenta pravia In the first specimen the entire upper portion of the cervical division was filled with placental tissue, which extended down as far as the external os in tongue-shaped processes, closely adherent to the underlying tissue. The second case also presented a cotyledo pravia with a condition in the cervix similar to his other case.

Kronig in 1901 describes the lower uterine segment and cervix of a 19 year-old grid who died in the ninth month of pregnancy from cardiac disease. The child was recovered by Cæsarean section during the death agony The placenta was normally situated. Some areas of decidual cells were seen in the upper cervix.

Volk in 1903 presented a case of unusual During the examination of a luctic II-para the everted cervix was found to be the seat of several reddish patches of millet-seed size which bled upon slight trauma tion was taken for diagnosis three neeks before the onset of labor at term The cervical tissue presented considerable ordema, while the plaques under investigation were found to consist of decidual tissue Similar areas were seen underneath the healed erosions. In order to ascertain the frequency of decidual reaction in the cervix in placenta prævia, he removed a section from the anterior cervical wall of a woman recently delivered. The gross appearance of this lip suggested the presence of decidua, which was subsequently demonstrated by sections

Waldstein 's case, in 1903, was a twin prepancy in a VI-para The placenta was nancy in a VI-para The placenta was laterally implanted Post-partum bleeding suggested a forn cervix, and when retractives were applied numerous plaques appeared to view, suggesting a carcinomatous chance Sections taken for diagnosis from the vascular cervix gave a picture of a healed erosion, with large and small nests of decidual cells in the neighborhood of the external os, on the cervi-

cal flaps, and also under the eroded flap of the portio vaginalis.

Hohmder in 1003 investigated the cervical nucosa in 7 cases in various stages of pregnancy or introducted after birth. Decidua in the lower two thirds of the cervix was seen in 4 cases; twice with placenta previa and twice with normally situated placentae. The reaction varied in extent, sometimes being broad and extensive while in other specimens it was limited, as in the case of Volk.

Blumberg in 1905 reports a V-para who had been bleeding off and on until her fifth month of pregnancy, when examination disclosed several gray polyps the size of a bean in a large soft, and somewhat dilated cervix the polyps were removed for examination and the labor terminated. There was placenta pravia The polyps were found to be the seat of decidual change. His second case is that of a case which entered the Landau clinic with bleeding from retained secondary postabortum. The day following their removal severe hæmorrhage indicated inspection of Several granular areas were seen on the cervical lips, some of which were removed and found to be the seat of decidual formation.

Taussig, in his paper before our Society, reported a case of great interest on account of the multiple locations presenting decidual formation. The case was a primipara of 35 years in which a tubal pregnancy was associated with multiple uterine myomata, a cystic adenomyoma, and a parovarian cyst pregnancy occurred in the fimbrica ovaries, and by the spread of the placenta upon the posterior peritoneum became a case of secondary abdominal pregnancy Decidua formation was found in the uterus, on the posterior uterine peritoneum, in the non-pregnant tube, in the parovarian cyst, in peritoneal The decidua adhesions, and in the cervix noted in the cervix presented in the region of the internal os and for 1 cm. below, but could not be demonstrated in the lower cervical

It is more than possible that the case of Scitz does not belong in this list, yet it deserves consideration on account of its many peculiar features A woman 4r years of age, who had had nine children and two abortions, was operated in the Munich clinic for carcinoma. Her periods had been irregular for the past two years and there had been bleeding at irregular intervals. On this account the missing of two months' menstruation had not aroused the suspicion of pregnancy, and the enlargement of the uterus had been attributed to metritis. The organ, when removed by vaginal hysterectomy, suggested pregnancy, and was preserved in toto in formalin, after some of the preservative bad been injected into the specimen. Before the operation the cervix had been seen to be gaping, yet no membrane was visible in the canal. The lower cervix was considerably torn by builet forceps. On opening the uterus several weeks later a seven weeks' pregnancy was seen, with the chorion embedded on the upper lateral wall. The sac of the foetus contained clear fluid. Between the decidua vera and reflexa was a fresh, unorganized blood clot extending down to the internal os The cervix presents an early carcinoma. The internal os is nearly as wide as the dilated external orifice, and projecting down throughout the length of the entire cervical canal is a fold of decidua continuous with that of the uterine body, thus extending the circumference of the decidua vera to the external os. Histologically the membrane is identical with that of the uterine hody, although it is attached to the cervical tissue more loosely than that in the cavity of the corpus The membrane is also thinner The microscopical picture of the underlying tissue is confused, because of poor fixing of tissues and changes incidental to the developing carcinoma. Yet the author concludes that the cervix proper shows no decidual change and that the decidual membrane was forced through the somewhat dilated os by a combination of trauma during the operation and the injection of fixing fluid into the uterine cavity in the preservation of the speci-

Kermauner in the same year (1906) mentions the presence of cervical decidua in the upper cervix of his specimen of a post-partum uterus which had presented a placenta pravia. Bondi in 1907 describes the uterus of a 37year-old multipara which was removed in the second month of pregnancy for a carcinomatous polyp. Larger and smaller areas of decidual reaction were found in the region of the external os, some of which were covered with stratified epithelium. Decidual changes could not be demonstrated in the upper cervix

Stroganoff (1968) records a case of polypoid proliferation on the anterior cervical lip of a three months' pregnancy. This bled freely on contact and was removed for microscopic examination. It proved to he well-developed decidua. The upper layer was here and there covered with stratified epithelium. The patient remained under observation for several months without a return of the growth and without bleeding.

Gaifami (1909) and Ballerini (1910) also describe cases in which they have demonstrated cervical tissue Excluding the case of Seitz as not proven, and the observations of Guifami and Ballerini, which are recorded in the Italian journals, and of which I have seen only reviews, we find in the literature 22 reports of decidual change in the cervix in our search. Thirteen of these were observed in connection with placenta prævia, 8 with normally situated placente, and one in tubal pregnancies. Yet the more recent articles indicate the feeling that the condition is more common than hitberto believed. Indeed Ballerini's article is quoted in review as stating that such reaction occurs in 25 per cent of cases. It is of interest to recall that, of the 8 cases reported in normally implanted placenta, the decidual areas were noted on the lower cervix in 7 instances. On the contrary, in connection with placenta pravia the findings are reversed, since the upper cervix is the usual site. That this portion of the uterus is the site of decidual changes more commonly than hitherto supposed may he inferred from Hohmeier's observations (not mentioned above) that decidua was present in the upper third of the cervix in all of his 7 cases. All cases thus far reported show that the decidual formation occurs only in localized areas with-

out the production of a continuous membrane. My interest in this subject was recently revived by the observation of an unsual case of pregnancy in which bleeding from the cervix followed trauma and in which a watery, bran-colored leucorrheal discharge was a

marked symptom. At operation we found numerous small polyps surmounting bleeding areas of the thickened mucosa of a long narrow cervit with everted lips. Although the possibility of decidual growth was discussed, we then feared the tissue would prove to be malignant. The case is as follows:

Mrs. X X., aged 22 years The family history is negative for tuberculosis and cancer. She has never had scarlet fever, inflammatory rheumatism. nor diphthena Had typhoid when 13 years old and was confined to beil by it for eight weeks succession of attacks of "sore throat" was rehesed by the removal of the tonuls with the guillotine At 17 she gradually ran down in health while in boulding school Lost in weight from ros to ad pounds Ilad a succession of cukls in the head, with little or no cough but nith fever The glands pear the angle of the right ian non enlarged to the size of a hen's egg and remained smollen lor 5 or 6 months, until removed by operation. The diagnosis of this condition is uncertain although the surgeon stated that there was no evidence of tuber culous Two years later there was a shight recur rence and a few illustrate glands were removed hance then (2 years) has been in exiclient health until present complaint

Menstruation began at 15 years Was regular from the first, of the thirty day type Never but the slightest pain I loss lists 5 days No leucor

thir t. Marriel in June, tutz Last period July 5, 2012 Nausea began early in Sugast When 3 months pregnant, in this her first pregnancy a blood stained discharge risulted a few hours after contunand was shortly followed by painful uterine con tractions. The uterine discharge upon her napkin presenteil a salmon pink stain of 10 or 12 cm in diameter. It was so waters that it strongly suggested leakage from the sac of the osum, which sus picton was intensified by the strong odor as of vernix cascosa. The ilischarge gradually decreased with the subsidence of the pains, although it was still present after 5 ifavs The paint lasted off and on for 36 hours and disappeared after the use of morphin The patient remuneil in bed for to days A few days later, vaginal examination disclosed a 23/2 to 3 months pregnant uterus sharply anteffexed and with a long narrow cervix as it of an infantile type. The external os pouted slightly but did not admit the finger tip No evulence of placenta ntavia. No blood followed the examination, A speculum was not used

Shoutly after getting out of bed the patient began to complain of leutorrhora, seemingly aggravated by certise. Four weeks after the onset of the first attack she was severed with a similar one, even the dicharge nas not so profuse and was marked with small fresh blood clots. Uterine contractions continued at frequent intervals and with more samp pain for several hours, and, feeling that the was about to abort, I sent her to the hospital. Much to our surprise the uterine pains stopped during the night after a dose of morphin, in spite of the last that she was driven in an automobile some five mules to the hospital. The blood stained discharge lasted it days and was again folloned by profuse leuonrhear? Vaganil extimation was at this time smiller to that of two needs before, save that the external to left most graine. Latter, when alse was up and about or when ridings in the untomobile, the visions. You pure followed these discharges. The leuverthrung was profuse and was found to be of a home color and alcienticly wastery consistence.

Bleeding again followed coitus on November 22. without subsequent uterine contractions. Feeling that the pregnancy should not be allowed to run without a definite diagnosis of the condition, I sug gested diffting the cervix enough to permit the preside of one finger to explore the neighborhood of the internal os Upon examination in consultation, to justile the rick of abortion during this procedure, there was an immediate and profuse bloods discharge staining the sheets for a foot in circumference with bright red blood. The immediate hymorthage was commanative in amount in that seen a few hours after delivers. At least four pails folded into 4 meh with from a varil of sterile gauge were completch saturated before the patient could be moved to the Presbyterian hispatal for immediate de-

hien I fee hours fater November 26 1912 the patient was prepared for operation under either. On exposing the certist a most innusual condition presented to seen. Projecting through the gaping of and surmounting ridges of a bright red bring membrane, were 12 of 15 worm like polype moring in the sozing blood which seemed to arise from around their bases. These polyps of varying length (4 mm to r cm and a to 1 mm to diameter) appeared to crown longitudinal foldings of membrane just as the comb of a rooster is decorated with excrescenes The whole lining membrane of the cervical canal was arranged in longitudinal foldings about a cm spart, separated from each other by furrows greatest thickness of the folds of the memorane proper was at the margin of the bluish saginal where It measured 4 or 5 mm Of the color of angles orms, the papelle were seen of irregular contour distended at the end in an ordernatous smelling. Blood vessels could be seen in the depths of their substance. In texture the polyne resembled brom substance, breaking off when picked up with forceps. They appeared to cover with their bases at least one fourth of the lining of the canal The whole picture exchusice of the polyps suggested an extremely inlected decidual membrane with the difference that the furrows here ran parallel and vertical, as if they had arisen from the persistence of fortal plica pal-

As the diagnosis was by no means certain, and

fearing the possibility of sarcoma the operative plan was changed from anterior hysterotomy to dilation of the canal and morcellation and removal of the

ovnim The internal os easily admitted the passage of a No 8 Hegar dilator and the vascular cervix was stretched to permit the passage of No 26 which facilitated examination with the eye and finger The polyps were most abundant as a ring in the loner canal, yet were present for a cm above the os They appeared to decrease in size in the higher levels. The membrane however presented folds to the internal os 41/2 cm above its lower fellow Indeed the feel above was as of numerous protections extending as papillæ down from the maternal side of the festal sac which but loosely covered the internal os The lower uterine segment ap peared more funnel-shaped than usual as if there had been no widening of the lower pole of an infantile type of uterus. The upper edge of the cervix formed a very obtuse angle with the uterine body

The placenta was found in the right upper lateral pole of the uterus and the 42 month lettus with the membranes was crushed and removed with the membranes was crushed and removed with own forces. No pack was applied but strapings were taken from the posterior wall of the lower half of the canal for microscopic examination as a guide for subsequent creatment. Twenty four hours later these were found to present no evidence of

malignancy

The sections showed masses of irregular polyps together with considerable free blood. The margins of the polyps were covered with high columnar epithelium the protoplasm of which contained many granules There were glands with crenated edges, some being full of mucus. There was marked cedema of the stroma and the cells were widely separated showing stellate branches with vesicular oval and round shaped nuclei were many dilated blood vessels, for the most part with thin wall vessels Many lymphocytes and a few leucocytes were such scattered through the sec tion. In contrast with the areas just described the tissue presenting decidual change showed an even and rounded edge. The surface combehum was lower than in the other areas and in certain sections presented the typical flattened surface epithelium of uterine decidua. The cell margins were distinct and the nuclei round. There were comparatively few granules noted in the protoplasm The stroma was also very ordemitious and its cells bore no resemblance to the areas first described save that they were also of crregular and stellate shape. The cells presented the typical decidual type (Figs 1 and 2) The nuclei were rounded Many cells contained two nuclei There were areas of vesiculation scattered through the sections as if some cells had fallen from the reticulum. There were many lymphocytes in the tissues and the blood-vessels were markedly dilated. In favorable sections it will be seen that the large decidual cells



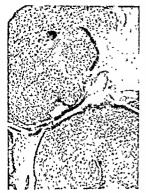
Fig. 1 The tissue on the bottom of the illustration has not undergone the decidual process

are grouped about the blood vessels as if beginning in the perithehal coat (Fig. 3)

Five days later under gas, the cervix was again inspected, when the site of the former excressiones was found to be occupied by an irregular and sloughing base with no evidence of the former picture. The examination of scrapings task in from the lower and upper halves of the cervical canal merely confirmed the chinical picture.

Cervical polyps have long been recognized as a source of bleeding during pregnancy, yet I can find no case on record presenting the picture given in our case. As a rule the polyps are single and of fairly large size

Three of the cases noted in this review show the bleeding may result from trauma of the decidual patches Volk's case bled from contact of the numerous plaques, while Stroganosi clearly shows that the bleeding in his case came from the decidual proliferations. Blum-



14. Observe the flattung of the epitlebum which is well should note margin. The presence of the bapphoreis of the thought of the destroy of the destroy of the destroy.

large strist case is of miters (in that there were several pidips the size of a bean in the lower cervity yet the mirked homorrhipe may will have come from the place into previously early would appear that the homorrhape in his second case (post abortum) arose from abrassins in the decidial area.

The treatment adopted by Strog noffcould not well have been attempted on my case even had I freen aware of his happy result. The denudation of the entire cervical cavity would present too many riskeven though it were proven that the growth was lunger.

Thus far no one theory has sufficed to retrained with presence of decident fissure in all travarious sites. It is doubtless true that a distinct and continuous membrane is limited to the interns, yet the cetypic decidin which arises in connection with pregnancy cannot will be distinguished from similar arises of the compact zone of the decidua vera. And until a better test arises to determine what is and what is not decidua, we must continue to take the cell as our guide, had guide though it be, provided the diagnosis is controlled by the study of wide enough areas and sufficient sections.

Cervical decidua associated with pheenta praxia may be extension from above downward, if the hostological os grows in size during the formation of the lower utrine segment, as suggested by llayer, yet a vacular cervivs described in the cases of the literature as a common feature to all. It may be that cervial tissue does not always arise from the stumulus of pregnancy alone, and the artifant of inflammation may commonly be necessary. Certain tis however, that malignant timory corcumstrated inflammations crustons, polyps, etc. are reported most frequently with the olders in this immost difficulties.



tig 3. Desidual cells may be seen on the side of the small blood worsh apparently arising from the perithelial lives.

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THE FATE OF BONE GRAFTS

By I RLDFRIC J. COTTON, M. D., AND HALSEY B. LODFR, M. D., BOSTON From the Laboratory of Suppost Pathology. Barrard Med cal-School

HE present active interest in bone and joint operations of the plastic sort makes urgent an exact knowledge of the processes of repair of bone and cartilage and especially an accurate knowledge of the ultimate fate of fragments of bone when transplanted or otherwise deprived of their normal nutrition

Much work, both chinical and experimental,

has already been done along these lines. Clinical work has given some results that show great promise for the future, but clinical work alone, even with adequate experience, can never give the necessary data as to what happens to transplants, or to bone or carillage deprived of direct vascular mutrition. Successful clinical cases can never give a concustic answer as to the manner of repair, or



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more than an industries of the firmtations which must be faced.

Experimental work in the past, has not given sufficient fundamental knowledge to explain satisfactorily the clima dismocsses and the tuliaris or to guide tutter work.

Many statements of behet have been much with a dogmeth definitiones that savors of tinality but they have been accompanied by ne sufficient demonstration there has to sulted a controversy increased perhaps by a lack of uninormity in terms, which leaves the subject in an exceedingly confused state The arguments as to the tate of bone grafts divide workers into two well defined groups At one carries are these who believe that the box griff is retained without coentral change in the bone transplanted and that it is in itself an artise center of centrilural growth so to speak those who believe in other words that the graft loses nothing and has all its inhirent powers of growth undis turbed. At the other extreme stand those who behave the transplanted bone is ultimate ly replaced by made formed bone, that the graft is merely a scaffedding taking no active part in repair, and is replaced by the repairs tive power of tissues entirely outside itsell

the believe that we are in a position to prove that mither of three views is a correct state ment of the facts Such difference of opinion can only be settled by a char demonstration of the detailed of the reportative processes in lone and the ultimate late of gerifs, by a knowledge of hundamentals only to be acquired by projectly conducted, and controlled experimentation combined with an accurate study and futer presented of operative specimens and clinical (335).

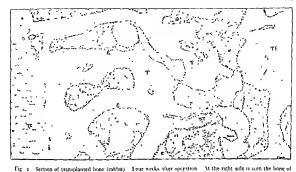
It is with the behalf that our experiments give tasts toward the solution of this problem that we make this preliminary report

We have been northing on a critical experience in various as parts the quantum of the fitte of transplants of bone and critique and irratin offer in onswered quastions as to bom and rathuge repair. So haved of mesesty will show an independent a pertinent of more or less of the work of meters and is more lakely to give a charge perspective than to develop absolutely may find.

As a whole the work is far from complete the orbit of operation become being the arbit of the crisis of the properties of the period of typer or and a specimens of free transplants of portions or boan within points has demonstrated of orbit certain forod principles of resum and generally forogard.

Accordingly, this perlamanary report is offered with a starting to what we believe already proved as to the tite of transplants of going bour when transplant in titing sperioring under adequate technique and is properly studied. There seems no question that the principal have do moust ruled (3.00 transformation) in the processing of sixth regarding them explosional

Our experimental procedum has been to introchoing portions of the formerd condicts, i.e. to femous a portion of one condict and replace it with a corresponding port of the opposite femous of the same animal. The transplants have not been such transplants but process of born of considerable size (or cred with the articular carried go no one side (fig. 1). In our early experiments a small steel join was used for texture of the graft. No joint texture in a steel size is a size of the first open transfer and rability of varying ages have been used. The animals show little or no impairment of function even immediately after operation function.



In the index part of the femor, all the red is graft the articular cartilize, shows at the fell. Note the almost entire the index part of the femor, all the red is graft the articular cartilize, shows at the fell. Note the almost entire the appearance of beine cells in the traincuble of the transplant and in the vicinity of the cut edge. Note also the service or own of cathes occlosulate very short. To have all transplantation attraction and the product of transplantation of the cut edge. E, inducted in the bone covering transplanted trabecular. It trabecular of transplant almost transplanted trabecular. The trabecular of femor

Our specimens show a practically uniform survival of the transplant when the technique is adequate, adequate technique comprising real asepsis fair approximation of the graft to its bed, and reasonable fixation of the graft

The articular cartilage of the transplant usually shows no gross change in color or texture from that of the surrounding unditurbed joint surface

In some few instances the cartilage of the transplant has shown a slightly less bluish color than the surrounding articular surfaces, this has not however been the rule

The fragment very rapidly becomes firmly fixed in place

Adhesions are absent or at most are lew and very delicate, this absence of adhesions is probably due to the constant use of the joint

Histological preparations obtained at varying intervals show a series of changes in the bony portions of the grafts, the more important of which are constant and very definite

It is not our intention in this preliminary teport to describe in detail the changes of secondary importance or of inconstant ap-

nearance The essential picture shown is. (t) the early disappearance of the hone corpuscles in the transplanted trabeculæ and in the trabeculæ of the host bone for a short distance from the wound surface, (2) without any loss of substance in (or any marked foreign body reaction around) the bone from which the corpuscles have disappeared, this bone is rapidly and completely covered by a layer of new endosteal bone, which unites with endosteal new bone of the host, (3) the new bone is laid down by the activity of end-osteoblasts in all portions of the gralts, center as well as periphery It has not vet been proved that some of the end osteoblasts which are active in the graft may not have originated from the endosteum of the host. and extended or even "migrated" from it to the graft, but no one after study of our sections can doubt that in part at least these osteoblasts represent the actively proliferating covering membranes of the transplanted trabeculæ, (4) practically no changes, either of degeneration or proliferation in the transplanted articular cartilage, at least up to four weeks.

DEPARTMENT OF TECHNIQUE

THE SPIXAL COLUMN AS AFFECTED BY TRACTION AND HYPEREXTENSION—A RADIOGRAPHIC STUDY

BY NATHANILL ALLISON, M. D., AND ARCHER OREILLY, M. D., SUNT LOUIS

OR the purpose of removing the pressure upon the diseased vertebral body caused by supermposed weight, and in order to transfer this stress to the posterior parts of the spinal structure, it has been the custom in the treatment of Pott's disease to employ such force as is needed to produce a separation of the vertebral bodies. This has been accomplished by either pulling the spine out by vertical traction or by bending the spine so as to gain a curve with its come exity forward. Chinesilly, it is wan existly

recognized that by this separation of vertebral bodies, secured by plaster of Paris jackets or braces, the tendency to deformity is lessened and the integrity of the vertebral body and intervertebral disk is preserved.

It is the purpose of the observations herein described to attempt to determine the actual effect produced upon the spinal column, in so far as the relationship of the bodies of the vertebra to each other sconcerned, by the ordinary clinical methodused in the application of plaster of Paris juckets

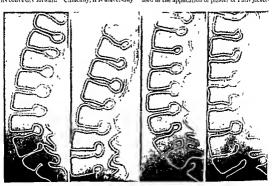


Fig. 1. Normal spine (a) Erect standing only, (b) vertical traction applied (c) hyperextension applied (d) hyperextension and vertical traction applied

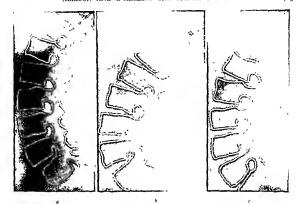


Fig. 2. Dorsal Pott's disease: (a) vertical traction applied (b) hyperextension applied, (c) hyperextension and vertical traction applied,

It was early recognized that rehable, readable radiograms could not be secured when taken through plaster of Paris jackets, and it was discovered that fenestrated jackets, where the windows cut were large enough to allow a lateral view of the spinal column, presented too great an alteration in the condition, which should be as nearly uniform and stable as possible and which should represent the spinal column as held by a properly applied jacket The necessity of securing in each series of radiograms a precise lateral view of the spinal column - that is, one in which the axis of Rontgen light was approximately at right angles to the mid-sagittal plane of the spinal column - was calculated upon, and a device was made which supplied the various positions of the spine obtained in the application of jackets and at the same time held the individual under examination in a fixed relationship to both the Rontgen tube and the sensitive photographic plate

This device consisted of a gaspipe lrame standing vertically, from the top of which a rod extended forward, which carried the vertical traction pulleys and head sling. Two adjustable

shoulder gardie supports also ran forward, to secure the shoulders by avullary loops. An adjustable pelvic belt also extended forward from the frame and there was a sliding screw pressure plate which could be placed against any region of the spine, by which any desired amount of hyperextending force could be secured. The Rongen tube was then placed at a known and recorded distance from the individual's side and recorded distance from the individual's side and recorded distance from the individual's side and recorded distance from the individual's side and recorded distance from the individual's side and recorded distance from the individual's side and recorded distance from the individual's side and recorded distance from the individual's side and recorded distance from the individual side and recorded distance from the individual side and recorded distance from the individual side of the side of the individual side of the side

- Normal strate in childhead
- Normal spine in childhood.
 (a) Vertical traction applied
- (b) Hyperextension applied
- (c) Hyperextension and vertical traction applied
- For the above set of views three children, aged respectively five, seven and nine years, were used. The spinal columns in these cases were normal.
- z. Pott's disease, dorsal:
 (a) Vertical traction applied
- (b) Hyperextension applied

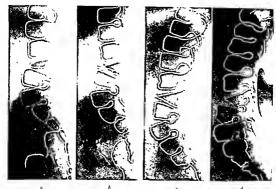


Fig. 3. I umbar Pott's disease. (a) Frect standing only (b) vertical traction applied (c) hyperextension applied, (d) hyperextension and vertical traction applied

(c) Hyperextension and vertical traction apphed

For this set of views two cases of dorsal Pott s disease were selected, aged respectively five and seven years. The disease in these cases had reached a stage of well-marked deformity, but in neither of them were there active symptoms

2 Pott 8 disease, lumbar

(a) Frect standing only

(b) Vertical traction applied (c) Hyperextension applied

(d) Hyperextension and vertical traction ap-

phed

For this set of views two cases of Pott's disease at or near the dor-o-lumbar junction were selected. aged seven and cleven years respectively. In each case there was well-marked deformity and the nationt presented no symptoms of acute process

The series of radiograms obtained were of such a character that reproduction of many of them was not possible, though the vertebral bodies were visible in the plates, the varying densities of the structures made photographic reproductions unintelligible It was, however, possible in studying the plates in series to see the effect

produced upon the spinal column by vertical traction, by hyperextension, and by a combination of these two forces It was found that vertical traction alone produced a considerable separation of the vertebral bodies, both in health and in disease, also that by vertical traction the spinal column was straightened as a whole - that is, the posterior dorsal curve and the anterior lumbar curve were considerably reduced By hyperextension alone a wide separation of the vertebral bodies was secured in the region to which the hyperextension was applied, but there was a corresponding compensatory increase in the other curves of the spine. By hyperextension and vertical traction a wide separation of the vertebral bodies was secured without so great an increase in the compensatory curves as where hyperextension alone was used, and a lessened kyphosis, with a separation of

diseased bodies at the region of the disease It may be concluded that vertical traction, associated with hyperextension, gives the best resultant position to vertebral bodies that can be obtained by the use of apparatus for securing correction in the treatment of Pott's disease

SILVER IODIDE EMULSION—A NEW MEDIUM FOR SKIAGRAPHY OF THE URINARY TRACT

BY HOWARD A KLULY M. D. AND ROBERT M. LLWIS M. D. BALTMON

Of the many preparations recommended for use in the urinary tract for X ray purposes, none can be said to the authout disadvantages. Collargod is probably the most widely used and may be taken as a good example of the group. The chief objections to collargod are three in number.

1 It is a dirty drug, which stains everything

with which it comes in contact

2 The expense of collargol is considerable in one is doing any amount of urmary radiographic work. A well-known urologist larely injected as made as twelve dollars' worth of the substance, in attempting to get a radiogram of a discreticulum of the hadder. Even with this amount his result was not satisfactors.

3 Collargol is a proprietary preparation con-equently one does not really know what is being injected into the bladder, ureter, or renal pilits. This we consider an important argument against its use, given a satisfactory substitute.

Reports of harmful results following collarged injection have come from various sources in two cases operated upon by kelly in the last few months, which were previously injected with collargol (by an assistant), it was noticed that the pertiroid itsupes were stained a greensh black, the collargol having passed through the pelvis although the latter was intact. In neither case was an excessive amount of the solution injected, now as it run in rapidly. In this case it was feared that the pelvis had bein runbured, this was not the case, however, in their histance. One of these cases required prolonged dramage before healing.

To be suitable for use in the urmary tract as skiagraphic medium a liquid must have at least three properties. It must be sufficiently obstructive to the X-ray to cast a good shadow when used in small amounts, it must be non-

toxic, and non irritant

None of the bismuth preparations are satisfactory. The soluble salts are touc and so cannot be used. The insoluble salts settle rapidly from the best suspension, and so are not of service. The various simple solutions of silver salts are very tritiating.

The use of an emulsion of the todade of silver for slangraphic purposes was suggested to us by the fact that it has already been successfully used therapeutically in the urethra and blailder t

the notate in observa smooluble in water and it is therefore, necessity to suppend it. This ster found is not seed accomplehed in mediago of the control of

The advantages of our preparation over others an its cleanliness it does not stain. The start strength used is known and can be controlled. On the other hand, the concentration of the proprietary preparations is unknown, and according to stirt varies to a considerable degree. The cutshion of silver folded possesses antiseptic properties. It is also bland and entirely non-irritant. The cost of the preparation is mean-insteadile, amounting as a rule to one dollar a pint, as compared with the cost of collargol, which is over five dollars for the same quantity which is over five dollars for the same quantity.

As an objection to the use of any emiliation in the ureters and renal pelvis it has been urged that the salt would be likely to settle, to remain in the pelvis or ureter and form a ridus for future calcult. With this in mind we have carefully meetinged cases after injections of silver toddle, and have come to the conclusion that this objection is more theoretical than real. This point will be brought out under the descriptions of the illustrations.

The plates described were both made of ureter myceted with per cent emulsion of subre 1 lodde. This concentration we find to be sufficient for any ordinary work. It casts a decidedly better shadow than does collarged of equal strength. The shadow is fully as dense as that made by a 10 per cent collarged solution. These facts were determined by taking randograms of test tubes containing the solutions mentioned A less concentrated preparation may be employed if a

t The Use of Ioshde of Silver in Urethrit v " by E II Siter M D and A A thie M D Univ of Penn Med Bull May 1905

cavity of any size is to be injected. For example, a 1 per cent emulsion may be used to advantage in the X-ray work on a large hydronephrotic ureter and pelvis or in the bladder. In skiagraphy of the latter we find a sterile suspension of bismuth subnitrate in water satisfactory and inevensive.

Fig 1 A calculus is shown lodged in the left ureter low down in the pelvis A catheter was introduced past the stone up to the pelvis of the kidney and 175 cc of clear urine withdrawn in a



Fig 1

fea mutes, 16 cc of a 5 per cent silver roduce emulson were then slowly supercted. This caude no hain during injection or subsequently. A local plate of the kidney shows the opaque solution in the pelvis, which is not distended. The illustration is a reproduction of a plate taken of the lower ureter, showing very clearly its distended condition above the stone. Name of the injection has as yet found its way downward past the obstruction into the bladder.

Before withdrawing the catheter the injection was given everal minutes to run out. A few cubic centimeters of sterile water were used to wash away the remaining particles. Two days later cystoscopic examination showed a small amount of silver iodide clinging to the ureteral.

orifice. Another X-ray examination of the ureter and kidney at this time failed to demonstrate the presence of the least amount of any opaque substance above the stone, although the plates were unusually good

During the operation for the removal of the calculus, five days after the X-ray examination, the ureter was opened and its mucosa in-pected, but no particle of silver iodide could be demonstrated

Fig 2 shows the pelvis of what proved to be a normal kidney injected with 8 cc of 5 per crust styler rodde emulsion. Here the shadows of the papilize are remarkably well defined. In this case a second radiogram of the ureter taken a few days after the first, as expected, failed to show muttices of the call removing the bidd.

show any trace of the salt remaining behind In view of these cases we conclude that the emulsion is a safe preparation to use for radiography of the entire urmary tract, and that there



Fig 2

is no danger of any precipitate remaining in the ureter and acting as a nidus for future calculus formation

SUMMARY

A 5 per cent silver iodide emulsion may be safely and satisfactorily used to inject the bladder, ureters, and renal pelvis for radiographic work. It casts as dark a shadow as does an equal amount of a ro per cent collargol solution.

It is antiseptic, non-irritant, clean, and merpensive. Its concentration can be accurately determined and regulated. It possesses the great advantage of not being a proprietary preparation

GALL-STONE ILEUS

WITH A REPORT OF TWO CASES AND TWO METHODS OF OPENING THE INTESTING

By JAMES SPENCER BROWN M D, MONTELAR NEW JERSEY Surgeon in Chief Mountainside Hospital

ASES of intestinal obstruction are comparatively rare, and gall-stone ileus seems to be the rarest form of obstruction Edward could find only 250 cases of gall-stone ileus recorded up to 1010. Bradbury reported one case out of 50,000 patients treated at the Rochester Royal Infirmary Mayo Robson records only 4 cases out of 80,000 in-patients and several hundred thousand out patients applying for treatment at the four largest hospitals in Great Britain, or about one gall-stone ileus to every 75,000 other cases Frank Martin, after "searching investigation among eminent surgeons, could find only 16 cases of gall-stone obstruction in about \$40,000 operative cases, or one in about every 33,000 Barnard of the London Hospital reports 8 cases out of 800 cases of intestinal obstruction from all causes. Of these 8, 3 recovered from the operation and 5 died A recent report from the Johns Hopkins Hospital, combined with the Union Protestant Infirmary and St Agnes Hospital, records only one case of gall-stone ileus out of 280 cases of intestinal obstruction

The records in my own surgical service at the Mountainstel Hospital differ somewhat Irom the above, and show that, while there was one case of intestinal obstruction to every 100 operative abdominal cases, there was an average of only one gall-stone ieleus to every 750 other forms of abdominal cases. Or, stated otherwise, mitestinal obstruction from gall-stones occured only one twelfith as frequently as obstruction from other causes

From the foregoing statement of cardulily collected statutes at a scripture state and a very busy surgeon will have relatively few opportunities to study gall-stone iteus. Yet, curnously enough, the diagnosis is easily made in most cases. It is true that the symptoms may simulate certain cancerous conditions, but in such cases it is highly probable that the previous history of the cast will help to clear up the diagnosis.

Unlike other forms of intestinal obstruction, in once of an attack of gall-stone lieus is usually gradual, and frequently intermittent in character. That is, the symptoms of intestinal obstruction may terminate suddenly, only to

recur, perhaps several times before operation But in cases where the occlusion is complete without remission, the clinical picture presented is that of the gradual closure of the lumen of the gut In these cases the stone is of such shape and so placed that it remains as a stationary plug to the intestine, and the closure is complete from the first. In cases that are intermittent or remittent in character, the shape of the stone is such that, although it forms a complete occluding plug to the intestine when in certain positions, it does not maintain these positions well at first It may plug the gut completely for a few hours, thus causing the typical symptoms of intestinal obstruction, but these symptoms may abate suddenly as the stone is displaced, only to recur as the stone again falls into an occluding nostion

In a recent article on gall-stone ileus the X-ray as a means of diagnosis was mentioned. In cases where there are symptoms of a partial obstruction, if the X-ray findings could be demanded upon this method of diagnosis might be of value. But as a rule when the surgeon sees these cases there is no doubt about the method of procedure-they are cases of obstruction due to some mechanical cause, and operation offers the only means of relief In order to satisfy my own mind about the usefulness of the X-ray findings, however, I made some experiments upon lat women with a good deal of intestinal disturbance Without preparation I placed upon the abdomen the larger stone shown in the photograph With one of the best interruptless machine, whether screen was used or not, the detail of the intestinal contents was so pronounced that it is very questionable whether the stone could have been identified had I not known it was there

The operation in cases of gall-stone deus, as in other cases of intestinal obstruction, presents other cases of intestinal obstruction, presents intel difficulty as a rule. The seat of the obstruction is located upon intesting to the obstruction one to case of the properties of the obstruction open of by forming up the loner collapsed portion of the gat the present of the presen





I tg 2 I tg 1
Linteroliths in movel from the two cases reported
Reduced one fifth

Lase 1 Mrs 5 70 cears old Seen in consultation with Dr. Wallace in 1000. Sixteen cears ago this patient had an attack of prin which has thighosed as gall stone inlic. I'vo cears later she had a second attack whath day marked by second opigastro pion letter and journing listing about two weeks. There was a sudden subsulence of all symptoms and the patient was restored to health execut that from that time until the beginning of the present attack there was always distress a lew hours after taking fund. This distress u to low in the epigretrium to the left of the mullime. Forty eight hours before I saw her she was taken with severe epigistra para with no leder of acceleration of pulse. Her other semptoms were rather indefinite for 24 hours, when it was ecident that she was deceloring an inti-strail obstruction. At the time of the consultation the obstruction was complete and no gis had been pressed for several hours. The abilimen was right destroiled and painful temperature (rectal) 100° pulse 124 and weak

treatment of the state of the s

Got 2. Vis. M. ox cerus old the sule of a wa. Vin. Diporturn and so on a Jine 1922 on recondation with Dr. Irving Weeker and Ber hashoud. She was a sulf and the property of the same and the sulface of the large person singular simulation gill-stone colo. He properti fileses began as houst previous to my visit with abdominal print no moreover-cert the unablices. She slook, developed an intestinal obstruction which was complete at the time of my cust the hall been no passed of pis for swerral on contrast of the same and the sulface of the same and with cery great general tendences over the unable to the same and with cery great general tendences over the unable us. Her temperature was 10% iteratily, pube 64 and 10% in the same and the sam

Operation Mulline incision presenting intestine distended the obstruction was found in the ileum which contained a large enteroith (Fig. 2). Prohing by inexperience in Case 1, 1 made a cross-incision and removed a large faceted gill-stone then removing the upper clamp on the intestine, I introduced a Moynshan tube and empired the intestine of a quart or more of liquid frees. A double Connell or "liarness maker's" suture was run in followed by a running Lembert and the abdomen was closed. Time of operation 30 minutes. Her recovery mass uneventile.

In my first operation, cited above, the incision in the gut was made longitudinally. Now consider what stru tures are severed by such an incision. A thin longitudinal external muscular layer is split, a much thicker (and more important) internal muscular layer has its circular fibers severed across, a large number of valvula connecentes which run at right angles to the line of incision may be severed, and with them the innumerable vessels and lymphatics (lacteals) which are distributed transversely in the intestine Thus we have the greatest possible destruction of important muscle fibers, vessels, and extensive mucous surface. On physiological grounds, then, this method of incision, although the usual one, r- wrong

Observe what happens when the inclson is made transversely. A tim and relatively unamportant extrand invectual layer is out across, a thick, important circular muscular layer is offered to the post of the properties of the properties and there is a subject of the properties and their vessels severed, in contrast to the whole-ale destruction of these structures by the longitudinal incision.

longitudinal incision

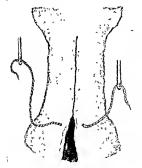
of course this is of minor importance practically, since the tremendously active collateral circulation in the intestines will take care of any



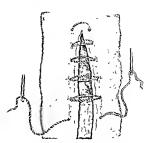
Showing proper transcerse incision of intestine

ordinary destruction of tissues What does concern us vitally, however, is, the fact that concern us vitally, however, is, the fact that necked have been as the great that the concern we may close the lumen of the gut, thus producing us effect be very condition we are trying to overcome. When the transverse incison is used there is, no possibility of this. The operator may practically dategrant the amount of intestinal wall taken up hyb the witures, whereas in closung the longitudinal incision he is limited to a scant, a mekes, evitant measurement, and very, much less than this internative.

While it is true that it matters little just which stirch is used in stomach or intestinal work, since the really important thing is always the "man behind the needle" rather than the form of



Showing contraction in closing the longitudinal in-



Double Connell or harness maker's stitch (One half of the vuture is represented as black in the drawing so that the course of each needle may be more easily followed).

suture, still it is strange that so useful a stitch as the double Conneil, or humes-maker's sitch, should be descarded by so many operators. This stitch offers many advantages over the single Conneil. And while it is true that its application is more difficult, nevertheless one may master its technique if one remembers two points first, all advance is to be made on the mucous membrane side, and, secondly, both needles must be pushed from the perstoneum to the mucous membrane before advance is stated.

The single Connell stitch does not include all the blood-sesses, and therefore some bleeding is possible—bleeding that may be severe, while with he double stitch, as shown in the drawing, no bleeding can take place. We have used this stitch now for four years in all our stomach and micstitual work, without a single case of bleeding or leakage, wherefore I am prompted to again call the attention of the profession to its merits.

A FURTHER CONSIDERATION OF THE USE OF CORPORA LUTLA IN THE TREATMENT OF ARTIFICIAL MENOPAUSE

In CHARLES A HILL, M. D. Perrset new

(AINCE the publication of my previous paper,1 I have received many reports of either parttal or complete failures in the treatment of artificial menonause with desiccated comora lutea along the lines laid down at that time The results obtained in my own practice were so much at variance with the reports received from some of my fellow-practitioners that I determined to investigate, and report if possible the cause of such failures. As a result of such my estimation I found that in-uflicient medication was the prime fictor in the failures to control the symptoms of menorages following the removal of both ovarioin some cases as few as twenty four 5 gratu causules were administered, while in others the maximum amount given was 100 capsules. Il you will ston for a moment and consider not the condition your patient presents at the time of induced menopsiuse the abrupt precupits tion, the patient complaining from the very start of bot this less the nervous symptoms mandested. you will understand why the treatment would of pecessity be one of some duration As many of these fiftients are young women they present all the symptoms of natural menopause in an aggravated form for it is well known that the severity of the symptoms are in proportion

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to the age of the patient, that is to say, the nearer she is to normal menopause the less will be the discomfort

The disturbing symptoms usually appear with m a short time after the operation, being experienced in order to the present of the condouble manifest itself, and continue, unless relief is given, for period of the construction of the three yasts. It has been my ceremonals to three yasts. It has been my ceremonals in symptoms of menopuse may cease be a time after instituting treatment with corpora latina, and then reappear after its administration has been decontinued.

The fortuniteties, in my opinion, that the medication as not continued over a sufficient teigth of time, and that in each instance it should be continued for everal view, and that in each instance it should be continued for everal view, after the patient presents a normal condition. I have found it mercurant moved off my cases to give at least too capsules, in others also, before I felt safe in discontinuing treatment.

In cases of relayee, the second course of treatment is usually much shorter than the first, fewer capsules bringing the desired result. Incomparison treatment behalf be included in the case instance treatment should be instituted as soon after the operation as possible. My procedure he here to administer five grain three times 1 day, one half to one hour helore much.

REMOVAL OF STRAIN FROM THE ROUND LIGAMENTS WHILE HEAL-ING, AFTER CORRECTING RETROVERSION OF THE UTERUS

BY W. F. COUGHTS, M.D. SUNT LOUR.

THE more aperations desired for the cure of a condition, the less likely is any one to be always satisfactory. There are many operations for the cure of retroversion and prolapse of the uterus, and when another sarrition is made in the procedure we small

Alquie thought he had solved the problem in 1841, but it took just forty-one years before anyone clse thought as he did, for it was then that Alexander reported his success with the same method and described the operation which has since borne his name. Since Alexander we have had many others and the end is not yet. The reason is that no single method is satisfactory in all cases. Since the conditions vary, so should the modes of cure.

In October, 1911, while attempting to fix lorsard a retro-cried uterus, I found the round lagaments so small and thin that I feated no lasting benefit would follow the usual procedure I took a strand of No 2 hard chromic catigut, doubled it, and grasped the end in the usual curved forceps. The point of the forceps entered the left external abdominal ring, traversed the inguinal canal, and presented in the subpertoneal space at the left internal abdominal ring SIII in the subpertioneal space, it was made to follow the line of the left round ligament till within two inches of the uterus. The pertoneum over the point of the forceps was now cut and the double catigut strand seazed by a second forceps and, being released from the first forceps, was feave in the first days in the haddeminal cavity.

The left round ligament was grasped in the susual way and drawn out in the usual manner by the first forceps. The eatgut was now pocked up on a curved needle where it had come through the pertoneum and the needle passed through the incision into the retroperstoneal space, along the ligament to the left cornu uters, then through the left broad ligament in the tubo-uterne angle. The two strands of catgut were now carried stagls and \$\frac{1}{2}\$ of an inch ajust a cross the post-tror aspect of the body of the uterus under the serous coat, then together through the tubo-uterine angle of the right round ligament in the subperstoneal the right round ligament in the subperstoneal the right round ligament in the subperstoneal.

space to a point two inches from the uterus. A curved forceps now introduced through the external abdominal ring on this side was passed up the inguinal canal and into the subperitoneal space at the right internal abdominal ring and made to follow along the right round ligament to a point two inches from the uterus, where it was brought through the peritoneum and the round beament and the categor caught and drawn out by it Care was taken, as is always done in similar operations, to see that no dimpling of the peritoneum occurred around either ligament as it was drawn through the internal ring median wound was closed in the usual way, the ligaments sewn to the anterior surfaces of the anterior sheaths of the recti, and then the catgut was tied so as to take all strain off the ligaments The perincum was repaired. The patient was allowed to be on back or side as pleased her during convalescence Union was per primam

patient left the hospital at the end of three weeks. Of all the justients I have been able to examine after an operation for retroversion and prolapse of the uterus, the result in this case was the best I have ever seen. The uterus remains higher up and more anteverted than in any of the others, and the patient is well and happy.

BIRTH BY CONDUPLICATO CORPORE

BY N SPROAT HEAVEL M D CHICAGO

When a trans ere presentation has so lar presented that the membranes have ruptured and the shoulder has engaged in the palvis, with the arm prolapsed in the vagina, the chince of the woman delivering spontaneously very smill. If the fortus is not decidedly premature very soft and compressible, the woman generally dies, undelivered, from rupture of the uterus. The larger the fortus and the smaller the privity, the greater the probability of this section of the procession of the privity of the procession of the privity of the procession of the privity of the procession of the privity of the procession of the privity of the procession of the privity of the procession of the privity of the procession of the privity of the procession of the privity of the procession of the privity of the procession of the privity of t

Birth max be effected by the slapping of the lower body half past the bead and shoulders sportaneous evolution. In such an event theresportaneous evolution. In such an event there is deducen use to fit he trush and breech, then of the ligs and last of all of the head. When this evolution occurs in the upper part of the pales, the shoulder rises, manifested by the prolipped arm ascending the variety in which case the birth is said to occur by Denman's mechanism. In the event, however, that the shoulder has descended to the vulva, the breech will have to passes the shoulder at the outlet, in which case the arm cannot ascend since the shoulder is freed. This rarry variation of the mechanism is named affer Doughs. Quite a number of lattle by spontaneous continuous are found in the Internative Days collected. 38 will identified cases, among which were 14, thildfun above 2,450 grams in weight, two of these were lorn alloweous.

Roederer, in the eighteenth century, told of the possibility of spontaneous harth in transverse cases by doubling of the body, and called the mechanism conduplicate corpore. In this mechanism the shoulder and arm continue to descend, the body is folded and compressed on itself, the head syrresed into the thoray or aldomen, and birth occurs by cypol-ion of the pro-

lapsed arm and shoulder, followed by the simultaneous extrusion of the head and trunk, breech and second arm, the feet are born last of all In birth by spontaneous evolution, the head is born

Though this mechanism may occasionally be seen in miscarriages, it is much rarer in births after the period of viability than is spontaneous evolution Except that the lortus be very soft and premature, unusual conditions must be present that birth may occur The pelve must be especially roomy, pains unusually efficient and severe and reinforced by good abdominal muscles, and there must be but little resistance in the soft parts. Consequently, in the reported cases we find that either the mothers have had a numher of easy births or have just given birth to a twin. The force of the pains may be judged from the frequency of fractures of the vertebra, the cranium, and the ribs of the feetus. In 1905 Zickmond rightly stated that a careful reading of the cases reported as conduplicato corpore shows that they are, with very few exceptions, cases of spontaneous evolution Franz, in 1910, after a very careful study, was able to collect only 14 undoubted conduplicate cases. In only three of these cases did the fortus weigh more than 2,500 grams Aside from the case which I report I have been able to add no other cases to this number In Dubois' case the weight is not given, though the woman was said to be at term patient died at once of sepus and hemorrhage In Adelman's case the feetus, which weighed 3,000 grams, had a cru-hed crantum Zickmond's case is especially interesting. A VII-para with the following measurements 27 cm, 30 5 cm, 35 cm, 10 cm cuni diagonalis 13 cm, gave birth, after a six hour labor, to a freshly dead feetus of from 3,750 to 4,000 grams, without tearing of uterus, cervix, or permeum, and had an uneventful puerperium. The vertebral column of the foctus was broken. The case I have to report is as follows

Mrs -- Hungarian 29 years old Mother had twins Mensirual history normal Married to years, 5 pregnancies before the present one. The first mecanned at fifth month, digital removal of remnants Four pregnan cies followed in quick succession, all full term spontaneous terminations with normal puerperia. Children weighed between b and 755 pounds the others 3 hours or under Midwie engaged each time but was never there in time for delivery Present preg

nancy Last menses October 10, 1910 (not sure) Was nauserted most of pregnincy, hall frequent heidsches and during fatter weeks had swellen ankles. Noticed that in fatter weeks she was unusually large. First pains at 6 a M June to 1911 Birth of the first twin sponianeou ly at 9 30 AM Midwife armied shortly afternards Four vacual examinations by the midwife without any attempt at cleanlines. The interne armed at 10 A y and found in transperse presentation with pulseless cord hanging from vagina, heart tones not audible Maternal pulse 1 to good and strong Transport of patient to the Pre-byterin Hospital where she armsed at 11 50 AM Surgical prep. aration. At this time temperature was 100° I pulse 126 Presenting at vulva was cord of second twin and placents and cord of the first twin Behind the placents was the left arm of the second fortus prolapsed into samus, with shoulder wedged deep into pelvis, back anterior and head on the right side of the mother Pains violent It tale draping her prehiminary to contemplated surgical delivery Patient had another unusually violent pain, and a dead hos was expelled from the vagina at 12 15 noon The prolapsed arm and shoulder first appeared, then the head impressed into the abdomen of the child, followed by breech and legs Patient began to bleed profusely, so that the placenta was removed manually from varing and lower the placenta was removed managery palpated for tears, the uterme segment and uterme cavity palpated for tears, the cervit was drawn into view pulpated and inspected. Yo tears were present except slight mucous teat of the permeal region Uterus packed and perincal tear repaired Plaeanix were separate Mother's convalescence uneventful, except on afternoon of delivery and on evening of fourth day when there was a sudden rise of short duration to to I the rest of the time temperature never over og F On dismissal (twelfth day) uterus well involuted and in good position First child male, weight at birth 5 points of ounces on dismissal 6 pounds 214 ounces. Second rhid willborn male, weight 6 pounds, length 40 cm. The head was compressed laterally and the temporal and parietal bone on one side fractured. The mother's measurements taken on diemiesal were 25 cm 313 cm ,33 cm ,22+ cm Promontor, not reached

The factors allowing the birth to occur were Unusually roomy pelvis, multiparity, no resistance of soft parts because of birth of first thin, strong abdominal muscles, efficient strong pains. The latus was of medium size, had but recently died, and was consequently not pliable enough to pass with the skull undiminished in size

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TRANSACTIONS OF SOCIETIES

CHICAGO GYNECOLOGICAL SOCIETY

REGULAR MEETING HELD DECEMBER 20, 1912

DR. ARTHUR H CURTIS. Dr. Watkins and I desire to report some specimens obtained at operation during the last few weeks. The first is a vaginal dermoid the size of a small orange which developed in the vaginal mucosa and protruded into the vaginal cavity in half of its extent. The tumor was located about 2 cm, to the left of the cervix. It was ulcerated and necrotic and contained sebaceous matter and considerable hair. The fact that there was no connection with the presacral or ischio-rectal spaces indicates that the tumor originated in the vagina and did not descend from either of these regions Vaginal dermoids are of such rarity that but few have been recorded in the literature

Three cases of tubal pregnancy are of interest because they occurred within such a short interval of time. One is microscopically worthy of your consideration because of its unusual rich-

ness in large syncytial cells.

A fifth and last case gave a history and findings negative in all respects except for pelvic pain and the presence of a moderately firm mass to the left of the uterus in the region of the tube At operation large numbers of adhesions were found about the left tube and ovary Enclosed in the adhesions and lying adjacent to the ovary was a recently formed clot of blood the size of a large hen's egg At first glance it seemed that we had to do with a ruptured tubal pregnancy Later examination, however, showed the tube to be absolutely normal. The overy contained a large ruptured corpus luteum, the raw surface of which was in contact with the mass of blood Sections through this region, which you may now observe under the microscope, demonstrate that this hæmorrhage is of corpus luteum origin Cases of hamorrhage from ruptured corpora lutea have been reported by Ries and others, their presence, however, is rarely diagnosed, despite the fact that they probably occur not infrequently.

DR. FRANK LYNCH read a paper entitled "Cervical Decidua Associated with Polypus,

Causing Bleeding During Pregnancy." (See D 601)

DISCUSSION

Dr. J. CLARENCE WEBSTER: The occurrence of decidual reaction is an interesting topic for discussion There can be no doubt that, normally, in the human female, it is a characteristic of the mucosa of the body of the uterus. That it may occasionally be found elsewhere in the Mullerian tract, viz, in the mucosa of the Fallopian tubes and of the cervix, is now well established Dr Lynch's case is an example of the latter formation.

Several years ago, while working at the anatomy of the uterus in pregnancy. I found that just as at the region of the os internum there was a gradual transition in the character of the glands of the mucosa, so there was in that of the connective tissue. In several cases decidual changes were found below the level of the os internum. It is not surprising, therefore, that polypoidal elevation of the cervical mucosa should also sometimes present these changes. The transverse sections exhibited by Dr. Lynch remind one of those found in cases of decidual transformation in the folds of the tubal mucosa. The connective tissue appears somewhat cedematous, the cells are enlarged, and the epithelium on the surface is altered from a columnar to a cubical or lower type

As regards the development of decidual tissue outside the Mullerian tract, there must be much difference of opinion. In the ovary it is easy to explain on the hypothesis that detached portions of the tract may become embedded in the organ and may undergo the genetic reaction. It is possible that other tissues near the tubes and uterus may occasionally contain detached bits of Mullerian tissue.

I am not at all convinced that large cells occasionally described in the omentum and other structures are decidual. The flattened cells fining the peritoneum may under irritation multiply below the surface and form groups of large cells resembling decidual connective tissue cells,

There is no proof that pregnancy can cause a true genetic reaction in the connective tissue of the omentum or any other non-Mullerian tissue

DR SCHMAUCH Dr Lynch's case is that of a young woman pregnant for the first time, suflering from repeated harmorrhage leading to abortion Looking for the cause, the doctor found quite large polypous proliferations of the cervix, suggesting malignancy. The cervix is the usual place for such polypi to start Besides, the microscope revealed a decidual change of the structures of these growths

Dr Lynch seems to be inclined to connect these findings with the miscarriage. However, as the ovum occupies that part of the uterus above the internal on we would be more justified in assuming changes in the cornus uteri, or still better, some deficiency in the maternal organism, as the cause of the abortion Even a eancer of the cervix or vaginal portion or a cervical fibroid are not sufficient to prevent nor-

mal pregnancy.

One of the few progressive facts that gynecology has produced in late years is Hitchmann and Adler's report of a constant periodical change in the uterine mucosa. These findings I value personally much more highly than all the operations devised during the past ten years for retroflexion and prolapse combined Still, the profession has been slow to draw conclusions

from these findings What I consider most important is the histological proof of a four weeks' periodicity in woman's life, consequently we have to change our views regarding menstruation. It is not the mere change in the histological structure of the uterine mucosa that brings on menstrual flow, causes bloody discharges from the uterus, it is rather a chemical change in the whole body of In order to bleed, noman's blood the woman must undergo certain changes If the blood did not lose its coagulability, the small lesions of the uterine mucosa would be insufficient to keep up the flow and the blood would coagulate before it left the uterus

I do not desire to go into detail, but in my opinion this young woman lost her foctus because her organism was not yet fit to stand the constant drain of mineral salts necessary to the building up of a child This agrees with Dr Lynch's finding of an abnormally anteflexed uterus. The small polym and their decidual change I regard

as mere accidentals

We all agree that decidual changes in the cerviv are rare.

Carl Ruge always pronounced the decidual

cell as not typical of pregnancy, he knew the pictures of a menstrual decidua, and dysmenorrhoic membrane. The decidual cell is not a specific cell, as, for instance, the nerve or epithelial cell It is the small stroma cell of the mucosa, of a connective tissue, that becomes enlarged and develops into the decidual cell. This name means nothing more than a transient condition of a cell similar to fatty degeneration, e. g. physiological and pathological changes.

Winter and also Webster want this trade-mark decidual cell reserved for the stroma cell of the uterine mucosa. Any other cell, connective tissue or mucosa cell, that undergoes the same changes and looks the same is not a decidual cell. but a decidua-like cell This question of a name is hard to dispute, however, it assumes a different aspect if we ask ourselves, what leads to this tentporary change in the cells Liveryone says it is the child, at least in pregnancy, an explanation for the decidual change in menstruation has not

as yet been tried.

The influence of the growing child always had comething mysterious for the gynecologist. Serial sections were made by the thousand, new stains were tried, but nothing was found. The plausible explanation given was that the decidual change facilitates the embedding and nourishment of the growing ovum. Not satisfied with these views, the theory of a poisoning of the maternal organism by the child was advanced. I do not know by whom, but it soon became common property. From the comiting to the pigmentation and to eclampsia, everything was explained by toxemia through the feetus This absurdity has kept gynecology and obstetnes at a complete standstill for the past ten

years If a farmer puts his wheat in the ground, it takes away some lertility from the soil necessary to build up the wheat plant. Since he has no chance to make serial sections he does not talk about poisoning, but comes to the conclusion that the wheat robs his soil of certain elements. If you transmit this simple explanation to the pregnant woman, pregnancy and woman's hie would be more easily understood. There is not much biological difference between the growing wheat and the growing ovum, both are robbing their soil, but not poisoning The most important element in making up human and plant organisms is the lime. This same lime is what makes the nucleus of our cells so easy to stain with hæmatoxylin, because it contains calcium proteids. This same lime has to pass through the syncytum, so easy to stam, in order to get to the fretus. On account of the greater vitality of the foctal organism, the latter takes its mineral elements wherever it can get them The law of propagation is so severe that even the woman with cancer or tuberculosis can give life to a strong child. Her own organism suffers, succumbs to the disease, but the child thrives. The feetus gets its supply of lime and other elements at first from the maternal blood. later on it will draw on the lime deposited in all the tissues Lime is one of the main factors that enables blood to coagulate If the loss of lime in the blood cannot be made up sufficiently. the woman is hable to bleed during pregnancy Quite a number of young women lose their feetus through constant hæmorrhage Prolonged rest in bed and time, on the other hand, have helped to save the ovum in most desperate cases

Now to come back to the decidual cells Their main characteristic besides their size is the fact that their nucleus does not stain well, in direct opposition to the high affinity of the normal stroma cells to stain. Again, where do we find decidual cells? Dr. Lynch mentioned all of the places. They are always situated around blood and lymph vessels, in the pelvis, on all the roads that carry nourishment to the feetus. This is the reason why Waldeyer proclaimed the perivascular origin of the decidual cell In the same manner as we sometimes find the epithelial layer of the uterine glands undergo syncytial changes through chemical changes, the same influence of altered nourishment is liable to transform any connective tissue cell, not even muscle cells excepted, into decidual cells. But all these phenomena are not the result of a poisoning, they are In my opinion to be regarded as a temporary robbing or enriching in the original elements making up nucleus and protoplasm.

DR WALTER C JONES The conclusion of Dr. Schmauch in regard to the fallacy of the theory of toxemia of pregnancy may be correct. ever, I object emphatically to the method of his reasoning by comparing the development of a feetus in utero to the growth of a plant in the soil In the first place, reasoning by analogy is fallacious Secondly, he chose a very unfortunate subject for comparison, as far as establishing his point is concerned For according to modern agricultural research, the theory has become pretty thoroughly established that plants in the process of their growth deposit toxins in the soil, so that after a few years any given plant has thus made the soil more or less inimical to its further growth. By counteracting these toxins the same plant may be made to grow on indefinitely in a

soil which was originally suitable. This idea is not a mere hypothesis, but is a well-established theory based on abundant actual experimental evidence which has been produced at numerous state and federal agricultural experimental stations, and among scientific agriculturists this theory has almost displaced the old one that plants in the process of their growth abstract from the earth certain elements necessary for their growth and thus impoverish the soil. Hence it seems evident that if the doctor wishes to convince others that the theory of toxemia of pregnancy is incorrect, he will not be able to do so through reasoning by analogy, especially if he selects such an unfortunate subject for comparison. I would suggest, on the other hand, that he present experimental and clinical evidence

DR WALTER C JONES, by invitation, read a paper entitled, "Inversion of the Uterus, with a Report of a Case Occurring During the Puerperum and Caused by a Fibroid" (See p. 632.)

DISCUSSION

DR DORLAND I have had some experience in uterine inversion. It was my privilege to encounter what I believe to be one of the most remarkable obstetric cases ever experienced in Philadelphia The patient was an elderly primipara, 34 years of age. The presentation was the first position of the chin I expected to have an easy delivery, but after full dilatation of the os no descent occurred Under ether I attempted to perform a cephalic version, but failed Podalic version was then attempted but was found imposible Craniotomy was performed through the eye, but the head failed to collapse Finally, by combined traction from below and pressure from above a very large feetal monstcosity was delivered, the uterus immediately following it in a condition of complete inversion, I stripped off the placenta, mmediately re-inverted the fundus, and packed the cavity of the uterus with sterile gauze. An active hæmorrhage was taking place from a vestibular tear above the urethra. The bleeding joint was ligated and the tear sutured Notwithstanding the prolonged labor with much digital exploration, attempts at version, the performance of cra-niotomy, inversion of the uterus, replacement of the fundus, and repair of a vestibular laceration, the puerperium was absolutely apyretic and recovery complete. The monstrosity was a case of iniencephalus or retroflexion of the feetus, a very rare form of teratism, with solid union of the skull and spine as far as the lumbar region Subsequently I assisted

718

Dr Baer in an operation upon the wife of a farmer at Trappe, Pennsylvania, for the removal of a large sloughing uterine fibroid polyp which closely simulated uterine carcinoma in all its clinical manifestations. In the removal of this large polym, which was about the size of a six months' fœtus, and which was attached to the uterine fundus, a partial inversion of the uterus occurred. This was replaced by a gauze-wrapped instrument without injury or further complications

Dr. HERBERT M. STOWE: I have observed three instances of acute inversion of the uterus follow-

ing delivery The first case was one in which the inversion occurred when the attending physician attempted to deliver the placenta by traction on the cord There had been some bleeding in the third stage, and placental delivery was tried as a hamostatic measure. One hour later, I found the uterus inverted and lying in the vagina. The placenta had been peeled off the uterine wall with resulting free bleeding. The woman was in shock, pulse 140, weak and thready There was no free bleeding at this time. Absence of the fundus in its normal position was easily demonstrated. The parts were cleaned and covered with horic acid compresses and morphin administered. The following morning, some 18 hours later, an attempt to replace the organ was successful and the woman recovered promptly

The second instance was evidently due to a violent effort to expel the placenta by the Credé There nas method Inversion was complete little bleeding but the shock was marked. The placenta was partially detached before the accident occurred, and it was easily removed afterward I saw this patient some two hours later, after several frontless attempts to replace had been tried. In expectant treatment was recommended until the symptoms of shock had subsided, and the organ was replaced without much difficulty on the second trial

The last inversion took place 14 days postpartum, and was due to straining at stool case is very similar to that reported by Ferré (L'Obstétrique, March, 1905) where the inversion occurred 6 days post-partum from the same cause This patient collapsed at once and had to be carried back to her bed. The fundus did not appear at the vulva, but the cup was plainly felt by abdominal palpation Symptoms of shock di-appeared within 12 hours, and the uterus was replaced under ether anxisthesia. The patient re-

covered In all these cases the utero-vaginal tract was tamponed with lysol gauze to prevent a recurrence of the accident.

During the stage of acute inversion, which is rarely fatal per se, I prefer to wait. If the patient appears to be bleeding to death a circular commession may be used. It is not advisable to operate during shock. The secondary shock may be sufficient to turn the scale against the patient. An analysis of 184 cases collected from the English literature supports this expectant treatment The total mortality was 43, or 23 4 per cent. Of 70 cases in which the uterus was replaced in the presence of shock, 24, or over 30 per cent, died. In 23 cases in which shock did not exist, no deaths resulted. In 17 cases death occurred before the arrival of the physician, and was generally due to shock In 45 cases in which the reposition was delayed until the condition was more or less chronic, reposition was effected without mor-

The prompt recognition of a paresis of the placental site should make the physician cautious in delivering the placenta, for if this portion is drawn into the contraction ring, any muscular action will cause it to be inverted or reinverted

according as it has or has not passed this point. Dr FRANK W LYNCH: Like the last speaker I have also had two cases of inversion of the uterus, both of which were seen in consultation first was in the service of a midwife, who claimed that she had made no traction upon the cord, but that the uterus inverted shortly after the birth of the child, after a fit of coughing She had removed the placenta before the arrival of the physician whom she had summoned to her assistance I found surprisingly little bleeding but considerable shock The uterus was replaced without difficulty by pressure immediately inside the cervix, and shortly after the correction of the deformity I was much surprised to find it balloon considerably above the navel, so that I was afraid to leave it without packing, although I he stated on account of the danger of interfering with drainage in a case which threattened infection I must also say I feared that rems ersion would occur following removal of the Ergot was given in the hope of combating the shock, as well as with a view of obtaining uterine contractions

The second case undoubtedly followed vigorous expression of the placenta in the hands of an able-bodied physician He acknowledged that pressure had been made when the fundus was not firm, and that suddenly the uterus seemed to disappear from his fingers. This patient lost considerable blood and went into profound and

immediate shock. The inversion in this case was not as complete as the other, and like it was easily reduced by taxis. No packing was used, nor did it appear necessary, as the case presented no subsequent complication I neglected to state that the placenta, part of which was not separated, was removed during the efforts at reblacement.

DR. RUDOLPH W. HOLMES: The subject of inversion of the uterus is one which has interested me for years, since I had my first patient with this rare complication. The existence of a fundaf fibroid of a polypoid character causing an inversion is of more interest in its gynecologic aspect than in its obstetric relation. So far as I can recall in my investigations preparatory to writing my paper on inversion of the uterus, no instance of inversion due to fibroid occurred in immediate relation to the puerpersum, so this case of Dr. Jones stands out as an unique one There can be no question, however, that, granted the existence of a fundal polyp, the gynecofogic inversion would be more likely to occur in relation to the puerperium than later, for the large softened uterus with a relaxed cervix would predispose to the descent of the fibroid, which would drag the fundus with it

In times past with a aroused much discussion why a primipara was peculiarly prone to inversion, this stands out clearly when we realize that primiparous labors bear a relation to multiparous ones as one to three or four, in my statustics, of 333 cases 68 per cent occurred after first labors. My own impression is that the explanation files in a faulty innervation or maldevelopment of the uterine musculature, or both. Contributory to this is the rather constant presence of the fundar placental site.

I believe all will bear me out that shock is rarely seen after obsettire operations, as my memory goes now I can hardly recall a fully developed instance of shock after delivery. On the other hand, shock is one of the most frequent, and in general the most characteristic, symptoms of the presence of inversion. This is in rather sharp contrast to the surprisingly slight hemorthages which may accompany the trouble. This is explained by the fact that contractions of the third stage are absent, therefore the placenta is firmly adherent to its site, on the other hand, the great pull on the ovarian vessels and disturbance, at least, of the uterine vessels minimize this danger.

We cannot lay down any hard and fastrules as to whether the placenta should be removed before or after reposition, in the main, I believe removal

after reposition is more desirable and safer, for it prevents the exposure of the placental site in great measure to contamination. Secondly, the removal of the placenta may irritate the uterus to contraction, which may seriously compromise the return. On the other hand, the placenta attached may prevent the ready return of the uterus, from the mere bulk of the mass.

uterus, from the mere bulk of the mass. In the days of the fate Nicholas Senn we heard much of the furor operations which held too many surgeons The numerous operative procedures outlined by Dr. Jones, and they are but a very few of the many methods of operative correction. incline me to believe that most of the operations suggested are brought forward to exploit the wonderfuf ingenuity of the originator rather than any particular call for their need Painstaking conscientious attempts at taxis will secure a return in by far the majority of cases. You may recall that many years ago the late Dr. White of London had a ease where taxis failed, the next morning amoutation was to be done, but during the night spontaneous reposition took place. This has occurred not so rarefy, and possibly may be explained on the hypothesis of a reversal of the vicious contractions. Not so long ago I had a woman who had gone between two and three weeks in her puerperium, with a recognized inversion. Under anæsthesia taxis seemed futile, even though continued for a protracted period; just as the announcement was made that it was useless to continue, the fundus snapped back into its normal position. It is axiomatic that the Lnife should never be used until repeated attempts at manual revision have failed.

There are two facts that must be borne in mind in manual reposition: one, that that part which came down fast, i.e. the cervico-uterie wall, must be returned first; by this procedure two layers of uterine wall are passed through the cervical enal while if the fundus is attempted first you have four layers. Secondly, it is well to direct the force of the pressure to either illo-sacraf fossa, thereby escaping the hindrance of the promontory.

To recapitulate: Immediate reposition; brisk binanual massage (the internal being within the uterine cavity), when contractions are secured, then manual removal of the great withdraw the hand with the contained placents without the hand with the contained placents without Credi; then immediate uterovarient surposed. This last, to prevent recurrence, so contain that I would wish this society could put itself on record that, from this day forth, any one who reposed an inverted uterus and did not use the tamponade was cultable.

COLLEGE OF SURGEONS

REPORT OF MEETING FOR ORGANIZATION HELD IN WASHINGTON, MAY 5, 1013

A N American College of Surgeons was organized at a meeting in Washington on Monday evening, May 5, 1913. Four hundred and fifty prominent surgeons of the continent of North America came together at the invitation of an Organization Committee which was appointed by the Clinical Congress of Surgeons of North America at its meeting in November, 1912 This committee consisted of Edward Martin of Philadelphia, Emmet Rixford of San Francisco, John B. Murphy of Chicago, Rudolph Matas of New Orleans, Albert J Ochsner of Chicago, Charles H. Mayo of Rochester, Minn. Frederic J Cotton of Boston, George Emerson Brewer of New York City, J. M T Finney of Baltimore, W. W. Chinman of Montreal, George W Crile of Cleveland and Franklin H Martin of

Chicago The invitations, which resulted in this large gathering of surgeons in Washington, were extended by the Organization Committee after a carefully prepared campaign in which each large university city on the continent was vested by a member of the committee who met, in person, a group of selected men brought together by a committee of three in each locality, which committee had been authorized by the Organization Committee to extend an invitation to the surgeons in their locality to meet the representative of the Organization Committee hundred men who were invited to the meeting in Washington, four hundred and fifty of whom responded, represented all branches of surgery and surgical specialities The surgeons responding to the invitation were designated as the Tounders of the College

FOUNDERS' MEETING

At this meeting in Washington, called for the purpose of effecting an organization, the Committee on Organization presented a definite tenture plate, which plan included a call of the meeting, the presentation of by-laws, the presentation of resolutions, and a plan for the completion of the organization by the election of governing bodies and executive officers

CALL OF THE HEFTING

The men were called together by Edward Martin, Chairman of the Organization Committee, who asked for the reading of the Call The Call of the Meeting was read by Franklin II. Martin, Secretary of the Committee. This call, which is herein quoted in part, summarizes the work for which the Committee was authorized.

ized:
"First, It should formulate a minimum standard of requirements which should be possessed by any authorized graduate in medicine who is allowed to perform, independently, surgical opera-

tions in general surgery or any of its specialties "Second, It should consider the desirability of listing the names of those men who desire to practice surgery and who come under the author-

ized requirements,

"Third, It should seek the means of legalizing under national, colonial, state or provincial laws, a distinct degree supplementing the medical degree, which shall be conferred upon physicians powersing the requirements recognized by this law as necessary to be possessed by operating

surgeon.

I ourth, It should seek co-operation with the metheal schools of the continent rather have the metheal schools of the continent rather have the present recognized standards, and urge these colleges to confor a supplementary degree on each of its graduates who have, in addition to their metheal course, fuffilled the necessary apprenticeship in surgicial hospitalis, operative laboratories, and actual operative surgers.

Fifth, It should authorize and popularize the use of this title by men upon whom it is conferred, and its use should especially be urged in all directories of physicians in order that the laity as well as medical men can distinguish between the men who have been authorized to practice surgery.

and those who have not

"The net result of the Committee's efforts is that five handred surgeons of all specialities, representing every large center of population, every important unnersity city with a teaching faculty of medicane, every special and general society representing a speciality of surgery, all the important surgeral choics and hospitals, besides many independent surgeons from all portions of the North American Continuous and the North American Continuous and the contemplation, and of this five hundred fully on hundred and fifty are here at this hour ready to fulfill their obligation."

The Founders' Organization was then com-

pleted by the election of Edward Martin as Chairman and Franklin H. Martin as Secretary, and the authorization of an order of business

BY-LAWS

The interest in the by-laws centered in: (r) The Name, (2) The Object, (3) The Formation of the Organization, (4) Its Administrative Plans, (5) The Meaning of the Fellowships, (6) Fees, (7) Directory, (8) Expulsion, (a) Standing Com-

mittees I. NAME. The name of the corporation is the

College of Surgeons

11. OBJECT. The object of the College shall be to elevate the standard of surgery, to provide a method of granting fellowships in the organization and to formulate a plan which will indicate to the public and the profession that the surgion possessing such a fellowship is especially qualified

to practice surgery as a speciality

Iff. Organization The corporation is to be known as the College The College shall consist of all members of the corporation, to be known as Fellows, and shall vest the general management of the corporation in a Board of Governors, and the Board of Governors shall in turn yest the details of the management in a board of trustees, to

be known as the Board of Regents

IV. ADMINISTRATIVE PLANS The Board of Governors shall consist of the five hundred surgeons invited by the Organization Committee to serve as founders of the College and who have signified their willingness to act in that capacity The members of the first Board of Governors shall also be known as the founders of the College of Surgeons

This original Board of Governors shall be divided into three classes to serve one, two and three years. At the annual meeting in 1014 and at each succeeding annual meeting, the Fellows of the College shall elect fifty surgeons to membership in the Board of Governors, each for a term of three years Thirty of these are to be elected from a list of nominations consisting of two members each nominated by the following surgical societies and associations of North America:

American Surgical Association, Section on Surgery of the American Medical Association, Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, General Surgical Division of the Clinical Congress of Surgeons of North America, Division of Surgical Specialties of the Clinical Congress of Surgeons of North America, American Gynecological Society, Southern Surgical and Gynecological Association, Western Surgical Association, Sec-

tion on Surgery of the Canadian Medical Association, American Association of Obstetricians and Gynecologists, American Orthopedic Association. American Association of Genito-Urinary Surgeons, American Laryngological Society, American Ophthalmological Society, American Otological Society.

Twenty members shall be elected at large to represent surgeons of North America not affiliated

with the above societies or associations.

The Board of Regents shall consist of twelve surgeons, members of the Board of Governors. elected by the Governors, these to be divided into three classes whose terms of service shall expire in one, two and three years Their successors shall be elected each for a term of three years. Not more than three of each class of four shall be elected from one country. The Board of Regents is increased to fifteen in number by three officers of the Corporation, the President, Treasurer and General Secretary. The two Vice-Presidents are

ex-officio members of the Board. The Board of Regents is the administrative body of the corporation, corresponding to a board of trustees in other corporations V FELLOWSHIPS. The Fellows of the College shall be graduates in medicine who are legalized

to practice medicine in their states and provinces, who have made an application for fellowship, such application to be endorsed by three Fellows of the College, one of whom shall be a member of the Board of Governors, and who meets the qualification requirements that shall, from time to time, he established by the Board of Regents. and who shall be elected to fellowship by the Board of Regents on recommendation of the Committee on Credentials.

Each Fellow of the College shall be designated a Fellow of the College of Surgeons and shall be authorized and encouraged to use the letters F. C. S. after his name on professional cards, in professional directories, and in scientific articles published in surgical literature.

VI. FEES. An initial fee of twenty-five dollars shall be required of each member of the College on his election to fellowship by the Board of Regents. The annual dues will be five

VII. DIRECTORY. The Board of Regents shall issue each year a directory containing the names and addresses of the Fellows of the College of Surgeons, arranged by states, provinces and colonies.

VIII. EXPULSION. Any member of the College may be expelled for unprofessional or other conduct inconsistent with the rules and regulations of this corporation by a majority sole of the Board of Regents.

IX. STANDING COMMITTEES. The Board of Regents shall elect the following standing committees: (1) Credentials, (2) Legislation, (3) Graduate Schools and Hospitals.

These by laws were unanimously adopted with the provision that the Board of Regents should make any minor corrections deemed desirable and present such corrections for adoption at the next meeting of the Board of Governors

OFFICERS ELECTED

President, J. M. T. Finney, Maryland, First Vice-President, W. W. Chipman, Quebec, Second Vice-President, Rudolph Matas, Louisiana, Treasurer, A J. Ochsner, Illinois, General Secretary, Franklin II. Martin, Illinois

DOUBD OF REGINTS 1. M T Finney, Maryland, A J Ochsner, Illinois, Franklin Il Martin, Illinois, George D Brewer, New York, George E Armstrong, Quebec, John B. Murphy, Illinois, Edward Martin, Pennsylvania, F J Cotton, Massachusetts, Herbert A. Bruce, Ontario C 1' Stokes, Washington, D C., William D Haggard, Tennessee, George W. Crile, Ohio, Robert E. McKechnie, British Columbia, Charles II Mayo, Minne-ota, Harry M. Sherman, Culifornia

SELLCTION OF FEILOWS

Much interest was manifested in the method to be pursued in the selection of the members of the corporation and in the method of conferring fellowships. A series of resolutions covering this subject was offered by the Secretary and adopted

The prospective Fellows are to be divided into four classes. A. B. C. and D. Classes A. B. and C are by resolution to be admitted without the formality of submitting to an examination under the following resolution:

"RI SOLVED, That the A class shall consist of

the founders of the College "The B class shall consist of the members of the special surgical societies constituting the Congress of American Physicians and Surgeons, and one hundred each, nominated by accredited committees, from the Section on Surgery of the American Medical Association, from the section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, from the General Surgical Section of the Clinical Congress of Surgeons of North America, from the Division of Surgical Specialties of the Clinical Congress of Surgeons of North America, from the American Association of Obstetricians and Gynecologists, from the Surgical Section of the Canadian Medical Association, from the Southern Surgical and Gynecological Association and from the Western

Surgical Association. "The C class shall consist of surgeons of prominence of five years in the practice of surgery or a surgical specialty and who, in the opinion of the Committee on Credentials, are eligible for fellow-

ship in the College without formal examination." for all others, coming under class D, the follow-

ing resolution was passed:

"BE IT FURTHER RESOLVED. That the Board of Regents, through the Committee on Credentials, limit the admission of Fellows to classes A. B. and C until the Board of Regents formulates a standard of requirements for class D and reports the recommendations back to the Board of Governors for approval at the meeting to be called by the Board of Regents in Chicago, November, Tota "

It will be the spirit of this association to open the fellowship to all competitors in surgery without favor Scientific attainments, surgical ability, unquestioned moral character, measured by the College's standards, shall constitute the measure for fellowship.

There are many hundreds of surgeons on the continent, who are not included in classes A and B, who fall into the C class Applications from these men will be welcome and their names will have the most careful consideration by the Commuttee on Credentials

All applications for membership should be forwarded to the Secretary of the corporation. It would add to the ease of the work of the Commattee on Credentials of references in the way of southers or recommendations from one or more well-known surgeons accompany each application for fellowshin

FORMAL CONFURRING OF FELLOWSHIP

The first convocation for the formal conferring of fellowships will occur in November, 1913, at a time and place that will be designated later. The first directory of Fellows will be distributed at that meeting. For that reason the applications for fellowships by men in A. B. and C classes should be filed as promptly as possible in order to facilitate the correcting of lists for publication.

ON MEMBERSHIP IN THE COLLEGE OF SURGEONS

By TRANKTIN III MARTIN, M.D., GINERA SIGRIFIAN

Since the organization meeting of the College of Surgeons of America, meny inquires have been received as to the method of procedure required to attain fellow dite in this organization.

To the fifters surgeous comparing it: Broad of Regents, representing territorially all sections of the North American comment, his been ourseted the distance task of formulating a reembes hipplan, to include the reception of applic tissus for member-hip and the total diction to follow-ship in the College of those fulfilling the standard of reguirments. The founders of the Gollege conferred upon the Board of Regents almost authorite of freedom of action in carryier out this prelimitary north.

While it is true that three classes of surgeons were declared eligible to election to fellowship in the College immediately the re-dulinos dealing with each of these classes provided that each individual thus named shall be continued by the Recents Jefore he can be formully declared a

Fellow of the College. These three groups include the surgeons and men practicing surgeral specialties who have been in the practice of their specialty for a considerable length of time and who are recognized as surgeons of established reputation. These are disoled for convenience into three classes. Class V men who were chosen to organize the College to the Committee on Foundation. Class II, surgeons who are mithered of comparison of surgeons and surgeoid specialises which are designated as constituent societies. Class C surgeons of introduced in Class A surgeons of introduced in Class A.

and not affairted with any of the societies represented in Class I).

Tor Class D, which will include all other candiates, names, young mun recently graduated in medicine who wish to practice surgery as a specialty, and men who have been in the practice of medicine for a longer period and art desirous of developing a vargical speciality, a special com-

mutee of the Board of Regents is carefully preparing a standard of requirements for admission, and this plan will be presented for the approval of the Governors at the November meeting

Of the A. B, C and D classes of members, the most three classes will be subject to remoderation during the next set months, and while the men in these classes have been declared (lightle to immediate membership, the Board of Regents has them measures to subject these names to the same careful scrutiny that will be employed in the selection of munkers from Class D

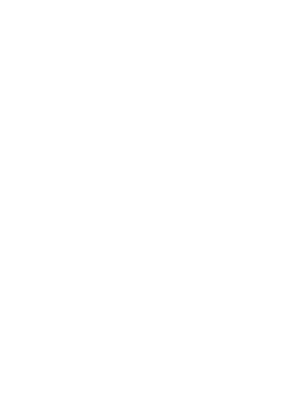
No man will come before the Board of Regents for final election to fellowship until the applicant has mide a formal statement in writing that he is desirous of becoming a member, such application to be accompanied by the membership fee.

Surgeons representing Classes A, B, and C will receive notice that they are eligible under the bylaws, and on request will be sent blanks upon which they can make their applications.

Surgeons who come under Class D, and in this tlass is included all legalized practitioners who are destroys of lecconing members, will be furnished ldank by the Secretary upon which they may make their applications, which in due time will be carefully considered by the Board of Regents.

It is the desire of the present Board of Regents to establish the precedent that any applicant for followship in the College will receive the fullest consideration

Finally, when a surgron's original application has been passed upon fasorably by the Committee on Credentials, he will be sent a fullowship blank, upon which he may make his detaration of acceptance of the principles of the College, together with such off data and information as the Regents may require as a matter of record. Applicant will be applicant will be day elected by the Board of Regents a Ythou of the College of Surgross of America.



SUBJECT INDEX TO VOLUME XVI

A BDERHALDI N'S biological test for pregnancy, 411 Abseess, Typho-tuberculous tubo-evarian 180 Adenomyoma uteri, Pregnanca in an, A new type of

ectopic gestation, 14 Amputation, of the cervit, Post-operative results of 390,

flaps, 432 Anasthesia, and anoci association, 627, Nitrous oxidi and

exygen, 622. Intratracheal ether, 206, Concerning sacral, 488, Lxperiences with intravenous, preliminary report, 206, A case of extensive subcutaneous emphysema following sutratracheal, with recovery 204 Anastomosis, Lateral intestinal, A modification of the

Ferguson Grant method, 325

Anoci Association, Anasthesia and 627 Appendix stump, A self inverting suture for the 68 Arthretis. The classification of \$4

B 1G. A new obstetrical rubber dilating 329 Bilocular bernia, 359

Biological test for pregnancy, Abderhalden's 411 Birth by conduplicate corpore, 713

Bladder, A case of earcinoma of the, Controlled by the high frequency current, 70 Blood supply of the uterus, The influence of myomata on

With special reference to abnormal utenne

bleeding, 144
Bone grafts, The fate of 701
Bowel, The value of complete physiological rest of the large, In the treatment of certain ulcerative and obstructive lesions of this organ, 6ro

ACUM mobile, I tiology of Lane's kink Jackson > membrane, and, 353

Calcult, Seminal, simulating nephrolithiasis, 302 Cancer, of the eery is, The cautery in the radical treatment of, 579, of the merus, The radical operation for 265, of the uterus. The radical abdominal operation for, 255, of the uterus. The extended abdominal radical operation for, 251, A possible factor in the rausation of, 190, How can we improve the results of our operations for, 185, of the cervix uters. The extended vaginal operation for, 284, of the uterme cervix, Results of the radical abdominal operation for, 304, of the uterus, The present status of the radical abdominal operation for, 563, of the uterine cervix, Results of the radical

abdominal operation for, 533, campaign, 102 Carcinoma. The first successful case of resection of the thoracie portion of the asophagus lor, 614, of the bladder controlled by the high frequency current, A case of, 70, of the cervix of the uterus, Results after the Werthern operation for, 203 Cautery. The, in the radical treatment of cancer of the

cers 1x, 579

Cervix, The cautery in the radical treatment of cancer of the, 570, Results of the radical abdomical operation for cancer of the uterine, 583, Post-operative results of amoutation of the, 300, Results of the radical abdom mal operation for cancer of the uterme, 304, of the uterus, Results after the Werthern operation for carcinoma of the, 293, Uters, The extended vaginal operation for cancer of the, 284

Cervical, decidua, 604, Rib, A report of two cases of, and an operative measure to prevent recurrence of symp-

toms, \$22

Chicago Gynecological Society, trans, 106, 113, 455, 632, 694, 715, Surgical Society, trans , 110, 223, 438, 566 Child Bearing, Litology, pathology and treatment of ovarian cysts in relation to, with special reference to hæmorrhage into the cysts, 63

Chinese War, Gunshot wounds of the, corr , 228

Cholecystitis, Acute perforative, complicated by general pentonitis, 386 Chone-Frithelioma Recurrence after three years Inva-

sion of the spinal canal Villian secondary growth, 362 Chylous cysts of the mesentery, Bibliography of, 606 Cicatricial contractions of the neck, lips and eyelids and

across joints Z-Plastic surgery l'lastic operations for clongate, 200

Clamp, An umbalical cord oo Clawfoot and how to relieve it, Si

Clinical Congress of Surgeons of North America, The field of usefulness of the, 480

College of Surgeons, 434, 720, On membership in, 723 Conduplicate corpore, Birth by, 713

Congress of Surgeons of North America, The field of uselulness of the Clinical, 480

Conjoined tendon, Some observations on the anatomy of the inguinal region with special reference to absence of the, 566 contractions of the neck, hips and eyelids and across

Z Plastic surgery Plastic operations for joints elongate cicatricial 200

Cord climp, An umbhical, 90, Tumors from a neurologic stempoint, The surgery of spinal, 475 Cospora lutea in the treatment of artificial menopause, A

lurther consideration of the use of, 712 Cysts, of the mesentery, Bibliography of chylous, 606, A tuberculous, probably of pancreatic origin, 96, in relation to child bearing with special reference to hamorrhage into the cysts I tiology, pathology and

treatment of ovarian, 63 DLCIDUA, Cervical, 604

Diabetes mellitus, 583 Diaphragm and positive pressure (Meltzer), Subcutaneous rupture of the, 135

Dilating bag, A new obsterned rubber, 329 Dilatation, Acute, of the stomach and its treatment,

Dislocation, of both bones of the forearm at the elbow, A case of complete antenor, 570, Primary traumatic dorsal complete radiocarpal, 400

Diverticulum, Notes of cases illustrating some of the surgical aspects of persistent Meckel's, 656, Meckel's, with report of four cases, 74, Meckel's, and complications, 200 Dystopic kidney, i

ECLAMPSIA, Obstetrical and surgical treatment of puerperal, 219

Ectopic gestation, Pregnancy in an adenomyoma uteri, A new type of, 14; Pregnancy associated with anomalous Fallopian tubes, 548, I'regnancy, A case of blood transfusion in, 577

Elbow, A case of complete anterior dislocation of both bones of the forearm at the, 570

Emphysema following intratracheal anxisthesia, with recovery, A case of extensive subcutaneous, 201

Enzymes of the blood as a means of extra corporeal diagnosis, The employment of protective, 418 Essential hamatuna, Unlateral Edney hemotrhage with reference to wealled 12

reference to so-called, 34

FALLOPIAN tubes, Ectopic pregnancy associated with

anomalous, 548
Femur, The open treatment of fracture of the, 429

Femur, The open treatment of fracture of the, 429 Ferguson Grant method, Lateral intestinal anastomous

A modification of the 325
Flaps, Amputation, 432
Feetal peritoneal folds of Jonnesco, Treves and Reid, and

their probable relationship to Jackson's membrane and Lane's Link, The, 341 Fracture of the femur, The open treatment of, 429

GALL-STONE deus, 700
Gotter and its relation to its structural and physiological units, 406
Grafts, The late of hone you

Gunshot wounds of the Chinese War, corr, 228 Gynecology. The last word on the X ray m, corr, 230

LI EMATOMA, Penrenal, 571

Hamatuna, Unilateral Lidney hamorrhage mith reference to so called essential, 34 Hamorrhage, Unilateral kidney, with reference to so-called essential hamatuna, 34, into the costs, Eucloop, pathology and treatment of ovarian cysts in relation

to child-bearing with special reference (5, 63 Hamorrhoids, The Whitehead operation for, A report of 200 cases, 273 Hermia, Bilocular, 339, Report of the radical operative cure of a double obturator, 422, Through the polye

outlet, 20 High frequency current, 4 case of carcinoms of the bladder controlled by the, 79

Hyperextension, The spinal column as affected by traction and, 703 Hypophysical surgery, A consideration of final results in.

541

LEUS, Gall stone, 700
Indigocammine intravenously as a test of the read function, Preliminary report of the use of 368
Inguinal region with special reference to absence of the conjoined tendon, Some observations on the anatomy

of the, 560
International Abstract of Surgery, 106

Intestinal stasss, Chronic, 600, Stasss, Orthopedic principles in the treatment of abdominal visceroptosis and chronic, 587, Anastomosis, A modification of the

Terguson Grant method, Lateral, 325 Intestine, Successful removal of over eleven feet of small, 40

Attracted ether anaesthesia, 296, Anaesthesia, with recovery, A case of extensive subcutaneous emphysema following: 203

Intravenous anasthesia, Experiences with, Preliminary report, 206 Intra-uterine hie, Do the parathyroids functionate in,

JACKSON'S membrane and Lane's kink, The fortal peritoneal folds of Jonnesco, Treves, and Read, and their probable relationship to, Jar, and carcum mobile, Eviology of Lane's kink, 353 Jonnesco, The fortal peritoneal folds of, Treves, and Read,

Jonnesco, The fortal pentoneal folds of, Treves, and Read, and their probable relationship to Jackson's membrane and Lane's kink, 34r KIDNEY, di stopic, 1, Hamorthage with reference to so-called essential hamaturia, Unilateral, 34

LACHRYMAL sac, Externation of the, 536 Lane's kink, Etiology of, Jackson's membrane and

carcum mobile, 553 Legal registration of the surgeon. The post graduate preparation and, 430; Regulation in the practice of surgery. The need of professional and, 441

Leucocyte count in pelvic suppurative conditions. The prognostic value of the, 403

MECKEL'S diverticulum, with report of four cases, 74; diverticulum and complications, 200, diverticulum, Notes of cases illustrating some of the surgical aspects

of persistent, 636 Meningitis, Indications for and results of operative treatment of otitic, 369, 276

ment of otitic, 369, 276
Menopause, A further consideration of the use of corporalutes in the treatment of artificial, 772

Menstruction, The pathology of uterine casts passed during, 651
Mesentery, Bibliography of chylous cysts of the, 606

Mesentery, Bibliography of chylous cysts of the, 606 Metabolism of normal pregnancy and the normal puerpenum, Some observations on the protein, 43

Myonis of the uterus and its bearing on X-ray therap; of uterace myonists, Relation between sarroma and 33 Myonists, The influence of, on the blood supply of the uterus, with special reference to abnormal uterus beecking, I44

N EPIfROLITHIASIS, Seminal calculi simulating, 302 Nerve roots in men, On the indications and results of the excision of posterior spinal, 463 Nitrous orde and oxygen amerished 4, 622

OBSTETRICAL rubber dilating bag, A new, 329
Obstructive lesions of this organ, The value of complete physiological rest of the large bond in the treatment of certain plectaint and, 610
Obturator herma, Report of the radical operature cure of

a double, 422
(Esophagus for carcinoma, The first successful case of resection of the thoracic portion of the, 614

Oophorectomy, Pregnancy after, corr , 230 Osteoplasty, 493

Ottate menugatis, Indications for and results of operative treatment of 369, 376

Osarian, cysts in relation to child-bearing with special reference to harmorrhage into the cysts, Litology, pathology and treatment of, 63, tumors complicating pregnancy, delivery and the puerpenum, 28 Oxygen anasthesis, Nitrous oxide and, 622

PANCREATIC origin, A tuberculous cyst, probably of,

96
Parathy road problem, The thyroid and, 595
Parathyroids, Do the, Junctionate in intra-uterine life, 147

Parathyroids, Do the, Innctionate in intra-uterine life, 147
Pelvic suppurative conditions, The prognostic value of the
leucocyte count in, 403

Petrocyte count in, 403
Pelvic outlet, Hernia through the, 20
Petropal hamatonia, 571

Pentrenal hawastoma, 57r Pentoneal, The fortal, folds of Jonnesco, Treves, and Reid, and their probable relationship to Jackson's membrane and Lane's kink, 34r

Pentonitis, General plastic, 372
Physiological, The value of complete, rest of the large bowel
in the treatment of certain ulcerative and obstructive

lessons of this organ, 610 Plastic pentonitis, General, 312 Portal vein, Experimental ligation of the, its application to the treatment of suppurative pylephlebitis, 481 Positive pressure (Meltzer), Subcutaneous rupture of the

diaphragm and, 135 Post Operative results of amputation of the cervit, 390 Post Graduate preparation and legal registration of the

surgeon, The, 439

Pregnancy, A case of blood transfusion in ectopic, 577, Ectopic, associated with anomalous Fallopian tubes, 548, Abderhalden's biological test for, 411, after oophorectomy, cor1 , 230, and the normal puerpersum, Some observations on the protein metabolism of nor-

mal, 43, delivery and the puerperium Ocaman tumors complicating, 28, in an adenomyoma uten, A new type of ectopic gestation, 14 Procidentia uteri in elderly women, The cure of, 1 new

intra abdominal technique, 216

Proctoclysis, An experimental study, 560 Prostatectomy, 379, with special reference to the sequels, 618, Immediate closure in perincal 94, The Alter treat-ment of suprapulic, 332, by a composite method 424

Protein metabolism of normal pregnancy and the normal puerpenum, Some observations on the 43 Puerperal eclambsia, Obstetrical and surgical treatment of,

210 Puerperium, Some observations on the protein metabolism

of normal pregnancy and the normal, 43 Pylephlebitis, I vperimental ligation of the portal vein, its application to the treatment of suppurative, 481

RADIOCARPAL dislocation, Frimary traumatic dorsal complete, 400

Regulation in the practice of surgery. The need of pro-

tesuonal and legal, 441 Reid, The feetal peritoneal folds of Jonnesco, Treves, and. and their probable relationship to Jackson's membrane

and Lane's kink, 341 Renal function, Preliminary report of the use of indigo-

carmine intravenously as a test of the 568 Resection of the thoracic portion of the orsophagus for carcinoma, The first successful case of, 614

Retroversion of the uterus Removal of strain from the round ligaments while healing, after correcting, 712 Rib, A report on two cases of cervical, and an operative measure to prevent recurrence of symptoms, 322

Round ligaments, Removal of strain from the, while healing, after correcting retroversion of the uterus, 712 Rupture, Subcutaneous, of the diaphragm and positive pressure (Meltzer), 135, of the uterus, 330

CACRAL anasthesia, Concerning, 488 Sarcoma and myoma of the uterus and its bearing on X-ray therapy of uterine myomata. The relation

between, 315 Seminal calculi simulating nephrofithiasis, 202, durts,

Vasostomy-radiography of the, 509 Silk, The preparation of waxed, corr , 460 Silver todide emulsion, A new medium for skingraphy of the urinary tract, 707

Skingraphy of the unnary tract, Silver jodide emulsion-A new medium for, 707 Societies, Chicago Gynecological, tians, 106, 113, 455.

632, 604, 715, Chicago Surgical, trans, 110, 223, 438, 506, Washington Surgical, trans, 108, 227 Spinal column, Certain problems and procedures in the surgery of the, 553, cord tumors from a neurologic

viewpoint, The surgery of, 475, nerve roots in men, On the indications and results of the excision of posterios, 463, 474, surgery, Laperiences in, 117, column as affected by traction and hyperextension, 704

Spleen, Surgery of the, 233 Splenomegaly, The pathology of, a study of the operative and autopsy material from the Mayo Chine, 240 Standardizing surgical practice, A method of classifying

and, 438 Stasts, Chronic intestinal, 600, Orthopedic principles in the treatment of abdominal visceroptosis and chronic

intestinal, 587 Sterilization, The technique of tubal, 92

Stomach, A suggestion tending to simplify and make more

accurate the closure of the posterior edges of the wound margin after excision of saddle ulcer of the, 205, and its treatment, Acute dilatation of the, 662 Stram, Removal of, from the round ligaments while healing, after correcting retroversion of the uterus, 712

Strictures causing actention Dilatation of tight urethral, 225

Subcuticular suture, How to secure the end of a, 218 Suppurative conditions, The prognostic value of the leu-

cocyte count in pelvic, 403

Surgeon, The post-graduate preparation and legal regis-tration of the, 439 Surgeons of North America, The field of usefulness of the Clinical Congress of, 480

Surgery, The need of professional and legal regulation in the practice of, 441

Surgical practice, A method of classifying and standardszing, 438 Suture, How to secure the end of a subcuticular, 218, A

self inverting, for the appendix stump, of TENDON transplantation operations, Observations on, 84

Thoracic portion of the cosophagus for carcinoma, The first successful case of resection of the, 614

Thy road, The, and parathyroid problem, 595 Traction and hyperextension, The spinal column as affected by, 704

Transfusion in ectopic pregnancy, A case of blood, 577 Transplantation operations, Observations on tendon, 84 Treves, and Reid, and their probable relationship to Jack-

son's membrane and Lane's kink, The fortal peritoneal lolds of Jonnesco, 341 Tubal sterilization, The technique of, 92

Tuberculous cyst, 1, probably of panereatic origin. Tubo-os anan abscess, Typho-tuberculous, 180

Tumors, Ovarian, complicating pregnancy, delivery, and the puerpenum, 28, Skiagraphic demonstration of vesical, 308, The surgery of spinal cord, from a newrologic viewpoint, 475

Typho-tuberculous tubo-ovarian abscess, 180

LCER of the stomach, A suggestion tending to simplify and make more accurate the closure of the posterior edges of the wound margin after excision of saddle,

205 Ulcerative and obstructive lesions of this organ, The value of complete physiological rest of the large bowel in

the treatment of certain, 6ro Umbihcal cord clamp, An, 99 Urethral strictures causing retention, Dilatation of tight,

Unnary tract, Silver rodide emulsion, A new medium for skiagraphy of the, 707

Uten, The extended vaginal operation for cancer of the cervix, 284, A new type of ectopic gestation, Pregnancy m an adenomyoma, 14, in chilerly women, The cure of procedentia, a new intra abdominal technique, Utenne, cervix, Results of the radical abdominal operation for cancer of the, 304, casts passed during menstrua-tion, The pathology of, 651, bleeding, The influence of myomata on the blood supply of the uterus, with

special reference to abnormal, 144

Uterus, Inversion of the, 632, The present status of the radical abdominal operation for cancer of the, 564; Rupture of the, 330, The relation between sarcoma and myoma of the, and its bearing on X ray therany of uterine myomata 315, Results after the Wertheim operation for carcinoma of the cervix of the, 203, The radical operation for cancer of the, 26s, The radical abdominal operation for cancer of the, 255, The extended abdominal radical operation for cancer of the, 251, The influence of myomata on the blood supply of the, with special reference to abnormal uterme bleeding, 144

VASOSTOMY-radiography of the seminal duces, 569 Vein, Experimental ligation of the portal, its application to the treatment of suppurative pylephlebitis, 481 Vesical tumors, Skingraphic demonstration of, 308 Visceroptosis and chronic intestinal stasis, Orthopedic principles in the treatment of abdominal, 587

WashingTON Surgical Society, trans, 108, 227 Waxed silk, The preparation of, corr, 460

Werthern operation for carcinoma of the cervix of the uterus, Results after the, 191 Whitehead operation for hamorrhoids, a report of 200

cases, 213 X-RAY, in gynecology, The last word on the, corr , 230; therapy of uterine myomata. The relation between

saccoma and myoma of the uterus and its bearing on. 315

7-PLASTIC surgers Plastic operations for elongate L cicatnoial contractions of the neck, lips, and eyelids and across joints, 200

INDEX TO BOOK REVIEWS

Anasthetics and Their Administration Sir Frederic W Hewitt, 451

Brain and Spinal Coed Emil Villager, 132 Collected Works of Christian Fenger, The, 452 Chicurgische Operationslehre Edited by August Biet, Heinrich Braun and Hermann Kümmell, 340

Cyclop edia of American Medical Biography, A Howard

A Kelly, 231 Differential Diagnosis of Diseases of the Nervous System Henry Hun, 584 Diseases of Women

Arthur N II Lewers, 135 Fractures and Dislocations Levis A Stimson, 584 Lateral Cupature of the Spine and Round Shoulders

Robt W Lovett, 232 Operative Obstetrics Including Surgery of the New-Born, Edward P Davis, 58¢

Spezielle Chirurgische Disgnostik für Studierende und Arate F de Quer am, 462 Surgery of Deformities of the Face John B Roberts, 461

Surgery Its Principles and Practice Vol VI Edited by 182 arsh W meille !!

Surgery of Oral Diseases and Malformations, Their Diagnoses and Treatment George Van Ingen Brown. 340

Surgical After-Treatment L R G Crandon and Albert Ehrenfried, 462 Surgical Diseases of Children 11 m Francis Campbell,

461 System of Treatment, A. Edited by Arthur Latham and T Crisp, 232

Tumors of the Jaw Charles Locke Scudder, 232

Clinical Congress of Surgeons of North America

FOURTH ANNUAL SESSION CHICAGO NOVEMBER 10 TO 15, 1913



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CHICAGO AS A MEDICAL AND SURGICAL CENTER

II. MEDICAL SOCIETIES OF CHICAGO AND THE IMPRESS OF MEDICAL MEN UPON THEIR TIMES

BY ARTHUR R REYNOLDS, M. D. CHICAGO

RGANIZATIONS for mutual benefit of those engaged in the same pursuit is general in this age and needs no argument in its defense. It is obvious that men who are massed and acting as a unit in any given direction are more effective than when acting singly

It is fair to say that medical organization in Chicago has not only kept pace with the spirit of the times: it is far ahead of many other occupations, is excelled by few if by any other industry and is certainly far ahead of any other profession

When Chicago was young there was little tendency toward organization and the effort to arrange medical men for mass action has had its struggle. It has passed through the vicisstudes of inflancy. It has had its stage of boyhood pranks and follies but has emerged at last into its full grown manhood and is now m the sturdy stride of its greatest vigor.

According to a foot-note in "Early Medical Chicago," by the late James Nevins Hyde, A M., M.D., published in 1879, the date of organization of the Chicago Medical Society is given as 1836 but no other data can be found in corroboration. That there was some move at this time toward organization may be readily believed, for in the autumn of 1836 an act was drawn by Chicago physicians for the establishment of Rush Medical College It is not likely that such steps would be taken without consultation of the leading physicians of the town, especially as many able and public-spirited physicians were in active practice. There were such energetic men as Drs Harmon. Brainard, Goodhue, Boone, Egan, Dyer, Kimberly. Brinkerhoff and others busily engaged in organizing a Board of Health and other public affairs. Furthermore, the citizens were preparing for the incorporation of the city, which took place

in the following year. However, no permanent record can now be found and the date of organization of the Chicago Medical Society must be 1850 and from this time we now have a continuous The records show that the Society had its periods of alternating activity and somnolence in the earlier years, but on the whole kept pace with the spirit of the times and to-day has a resident membership of 2,427 and 100 non-resident members. The society is divided into fourteen branches scattered throughout the city and suburbs, each of which meets monthly. Ten other societies on the specialties-Neurology, Pathology, Urology, Dermatology, Laryngology and Otology, Pediatrics, Orthopedics, Surgery, Gynecology and Ophthalmology—are in affiliation with the main society. The special societies meet monthly and each has a flourishing membership. The main society meets weekly but in common with all medical societies in Chicago it does not meet during the summer vacation season. It has eighteen standing committees. A perusal of their titles will give an idea of the diversified character of the work covered by them. The standing committees are upon Public Relations, Ethical Relations, Membership, Criminal Abortion, Medico-Legal Questions, Milk Commission, Organization, Contract Practice, Compulsory Industrial Insurance, Abuse of Medical Charities, Entertainment, Program, Criminal Punishment, Patent Nostrums, Standardization of Hospitals, Election Commission, Medical Education, and Constitution and By-Laws All business of the society is transacted by a Board of Counselors consisting of fifty members. Fifteen are elected by the society at large and the balance by the branch societies proportionate to their membership.

The Physicians Club was organized in 1895 out of two clubs having the same purpose that bad The purpose existed for several years previous of the club as stated in the constitution is "to promote good fellowship among its members, to encourage high ethical standards, to advance the interests of the Medical Profession, and to discuss at stated meetings, topics of current interest relating in any way to medical affairs." There is a membership of 300 and meetings are held once a month, dinner is served and discussion on some selected subject is had afterward Physicians Club more nearly than any other organization is the forum upon which medicine meets the public. The ablest speakers and specialists both within and without medicine in the country have sat at their board and entertained the membership upon diverse subjects in which medicine is in some way inter-

The Medico-Legal Society of Chicago was organized in 1886 largely by the efforts of Dr. E. I. Doering The object of the society as stated in the constitution "shall be the investigation. study and advancement of the science of medical jurisprudence, the punishment of unprofessional and criminal practices by members of the medical and legal professions, the prevention of blackmailing and the procuring of such legislation as may be necessary to secure the ends above enumerated." There are So members composed of lawyers and doctors. They hold monthly meetings and in the earlier years were active in preventing unjust prosecutions of medical men Since other agencies have taken that field the Medico-Legal Society has retired. This society stands in a unique position in one especial way. The funds of the society have been so well invested that each member has had returned to him all the money he has ever paid in as dues or initiation fees and there is still a balance of several thousand dollars in the treasury. The present membership pay no dues and soon will expect a dividend from interest accumulated

There is a Medical Woman's Club of Chicago which meets monthly. There is a Society of Medical History doing excellent work.

There is the Association of the Medical Reserve Corps, 200 strong, in Chicago, and a Medical Golf Association 100 strong.

There are two Homosopathic Societies in Chicago, each with a membership of 150

There is a Homocopathic Woman's Club of roo members, called the After Dinner Club,

which meets monthly. As it can be taken for granted that men cannot assemble together in any legitimate cause without good resulting, so it may be granted that great good cannot fail to come from the meetings of the hosts of medical societies. The stimulus and information is important to the members It is also important to the public. The public is now very largely taking its information on medical topics directly from the medical profession. Less and less does the public turn to the almanac or the cure-all advertisement in the newspaper or magazine for medical information Less and less do the public prints cater to swindling medical advertisements and some newspapers do not give them any space whatever, while some of the leading magazines have borne-the hrunt of the battle that has exposed the ridiculous and harmful practices of medical advertisers.

All of these blessings can be traced to medical

organization and the impress of medical knowledge and the medical way of looking at things,

upon the people.

It is even claimed that the medical habit of seeking basic facts, the habit of weighing evidence or symptoms and the necessity for cautious speech gives the well-trained medical man an equipment that enables him to take up work in other fields or in other professions or even in business readily, while the ever present necessity of his being politic enables him to grasp the intriacties of politics more easily than those of any other pursuit excent the law.

Medicine is inseparably connected with the early history of Chicago, for Fort Dearborn was named for Major-General Dearborn, who, according to the late Dr. John B. Hamilton, was a practicing physician before he took military service. Dr. Daniel Brainard was educer of a newsiaper soon after coming to Chicago. Dr. Levi D. Boone was elected Mayor of Chicago. Br. Levi D. Boone was elected Mayor of Chicago in 1855. The late Dr. N. S. Davis delivered a series of six lectures in Chicago in 1850 on the Sanitary Conditions of the City and the Means for its Improvement. He pointed out the danger from drinking well water. One hundred dollars was raised by the lectures and was used to observe the control of the City and the Meanser from drinking well water.

what has since become Mercy Hospital. It has been said of those lectures that the plans Dr. Davis then suggested for a pure water supply and for its necessary complement—the proper diposal of the sewage of the city—are the basis of all that was done toward these ends during all the subsequent years.

Dr. J. V. Z. Blancy made the first analysis of Lake Michigan water in the winter of #855-56 and in 1860 taught the necessity of boiling the water as a means of purifying it. At this time Dr. John H. Rauch was Health Officer and Dr. H. A. Johnson was President of the Board of Health. Together they checked the cholera. Dr. Rauch later became an officer of the State Board of Health and commenced his great work of cleaning up medical practice and establishing minimum qualifications for medical education, and Dr. Johnson became an influential member of the National Board of Health.

While congratulating ourselves upon the power that organized medicine of today wields, and not unmindful of the blessings we enjoy, let us not forget the labor and the far-seeing wisdom of the early medical men of Chicago, for it is upon the foundation they budded that we now rest in security and comfort and that gives promise for the future.

In later 1-sues of this magazine in this department will appear a series of brief sketcher of the lives of those surgeons whose work contributed so largely to the importance of Chicago as a clinical surfical center: Edmund Andrews, Daniel Brainerd, Moses Gunn, Recves Jackson, Bogue, Powell, Lee, Christian Fenger, Ferdinand Henrotin, Nicholas Sent.

An article descriptive of the hospitals of Chicago, with illustrations, will be contributed by Dr. John Allornsby, while Dr. Mortimer Frank will write on the medical publications. Other articles will have to do with the medical schools and other factors in Chicago's medical life.

On the following pages appears a preliminary program of the clinics.

SURGICAL CLINICS

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Monday, November 19th

A. J. OCE 1422 - Apparent Republication JULION J. MONTES - Column Republications 1715 AS. LUM - German Republication at A. P. Hillist - Johnson Pare Rosell - 55 55 12. GREEFT H. WYSEROOF-Life Yes BAST-

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hOPMA's ELPR—Poldix - Heptal—11, J. R. PENGRIGION - Police Repair a tra

ARTHUR DEAN BLVAN - Probytras H = 21-G. N. El . IY - Reserved Begins - 10 to ta (a. V., GPLEN - Parentwood Hapital - 8 to 10

C G RUIOPD — St Joseph's Booptal — 2 GAPI, WAGGER — St. Joseph's Booptal — 10 to 11 W. H. ALLEOPI — St. Luke's Booptal — 2 T. A DAVIS - West Side Hospital - 1 to 3 LDWARD M EPONN - Vest Side Hopetal - 8 to . T. J. CO'd.I. Y - West Safe II spital - to to as L. V. LOWLER - Willard II spital - it to as

Tuesday, November 11th

N. M. 14 PCY — Aug Ptana Hospital — 8 to 10 C. G. BULOPD — Children's Memorial Hospital — 2 JACOB I PANE - Columbus II sental - 8 to 12 C. VOLINI - Columbus Latension Hospital - 9 to 12 LAWRING, EYAY - Cook County Hospital - 8 to 11 A (, /IMMI / MAN — German Hospital — 9 to 12 PAUL CPONNLRUD — German Hospital — to to 12 IN JAMIN II BREAKSTONE - Jefferson Park Hos-

pital -- 2 to 4 C. I. WYNI KON! -- Lake View Hospital -- 8 to 10 BUNIAMIN II, BRLAKSTONE - Maimonades Hos (4ta) - 10 to 12

P. WYLLYS ANDRIAWS - Mercy Hospital - 8 to 10 L. A GPII NSII LDLE - Michael Reese Horp tal - 8 I., I., McARTHUR - Michael Beese Hospital - o to zz D. N. PISLNDRATH - Michael Reese Hospital - o

LMANUIL TRIEND - Michael Reese Hospital - o

CARL BI CE - North Chicago Hospital - q to zz LMIL (, BLCK - North Chicago Hospital - 9 to 11

Bamuth work only.

VM. R. CHBHINS — Post-Graduate Hospital — z to 6 DIAY D LLWIS - Presintenan Hospital - 9 to 11 GIORGE OF TARNOWSKY - Ravenswood Hospital - 8 to 10

CHARLES II. PARKES - Sheridan Park Hospital - 8

fig. 1-7 - 1-25 - 1-12 Hebry - 1 al. C. 11 - 1- 1- 1- 1- Andre Hebry - 1 al. C. E. 1 E. 1 - 1- 1 [Why Hebry - 1 file A grand of the control of the second of the control

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Wall ICE . BUT ENOR - Revenered Happal-A G SCHROFTIFR - Raveziwood Hospital - 10 to 11 LAWRENCE RY (-S: Act my s Hospital - 10 to

CARE # 4C/FE - 2: Joseph's Hospital - to to th A L HALTFAD -St Like's Horrish -S to H CHIRLE DALLO - Coverety Hoppital - 1 to 1 A P HEINECK - West & de Hospital - 8 to 10.

Thursday, November 13th

A M PELCY - luguetana Hospital - 8 to to A J OCIIS ER - College of P. and S - 1 to 3
X M PIRC 1 - College of P. and S - 1 to 3 JACOB FRINA - Columbus Hospital - 8 to 11 JAMIS J McGCINN - Columbus Hospital - to to the OLINI - Columbus Extension Hospital - 9 to 11 LAWRENCE RIAN - Cool County Hospital - 8 to 11 WYLLIS AYDRENS - Cook County Hospital-

A P HEINECK - Cook County Hospital - 1 to 3 A G ZIMMIRMAN - German Hospital - 9 to 12 PAUL GRONNLEUD - German Hospital - 10 to 11 II R CHISLETT - Hahnemann Hospital - 8 30 C F KAIILKE - Hahnemann Hospital - 8 to 10.
C I WYNLKOOP - Lake View Hospital - 8 to 10.
Viewmondes I

BENJAMIN II BRI AKSTONE - Maimonides Iles ptal - to to 12

CARL BECK - North Chicago Hospital - 9 to 11

CARL BECK - North Chicago Hospital - 9 to 11

LMIL G BI CK - North Chicago Hospital - 9 to It Besmuth work only,

WM F. SCOTT - Oak Park Hospital - 10 to 12 M L HARRIS - Policlinic Hospital - 11 MORMAN KERR - Policlinic Hospital - 11 ARTHUR DEAN BEVAN - Presbyterian Hospital -

CARL B DAVIS - Presbytenan Hospital - 11 to 1 C. N BUSWILL - Ravenswood Hospital - 8 to 10 C. II McKLNNA - St. Joseph's Hospital - 10 to 12 C G BUI ORD—St Joseph's Hospital—2
A E HALSTEAD—St Luke's Hospital—8 to 11
W. H ALLPORT—St Luke's Hospital—2 AXEL WERELIUS - South Shore Hospital - q to 12 D A K. STECLE - University Hospital - 1 to 3 F A BESLEY - Wesley Hospital - 4 to 6 PAUL B MAGNUSON - Wesley Hospital - 9 to 12 II M RICHTER - Wesley Hospital - 4 to 6 C C ROGERS - Willard Hospital - 10 to 12

Friday, November 14th

A G ZIMMERMAN - Alexan Brothers Hospital -9 to 11. A 19 OF H.

A 19 OCHINER — Augustana Hospital — 8 to 1

EDWARD M BROWN — College of F & 5 — 1 to 3

F. A BESLEY — Cook County Hospital — 10 to 12

A.E. HALSTEAD — Cook County Hospital — 10 to 12

GEORGE F THOMISON — Cook County Hospital — 8 to 10

SYLVAN KUNZ — German Hospital — 10 to 12 GILBERT H WYNEKOOP — Lake View Hospital — 10 10 12.

BENJAMIN II BREAKSTONE - Marmonides Ho E WYLLYS ANDREWS - Mercy Hospital - 8 to 10 A GREENSFELDER - Michael Reese Hospital -

8 to 10 L McARTHUR — Michael Reese Hospital — 9 to 11 N LISENDR VIII — Michael Reese Hospital — 9 to

EMANUEL FRIEND - Michael Reese Hospital - 9 CARL BECK — North Chicago Hospital — 9 to 11 J. R. PENNINGTON — Policlinic Hospital — 2 to 4 CHARLES I ROWAN - Presbyterian Hospital - tx

COMMITTEE J CLARENCE WEDSTER CHAIRMAN FRANK T ANDREWS, CHARLES S BACON, and THOMAS J WATERNS

Monday, November 10th

CARLY CULBERTSON - Cook County Hospital - 8 HENRY BANGA - Policlinic Hospital - 10 THEODORE J DOEDERLEIN-German Hospital-9 FRANK T ANDREWS - Mercy Hospital - 8 to 10 EMIL RIES — Post Graduate Hospital — 9 WM B FLHRING - Rush Medical College - 11 ARTHUR II CURTIS — Wesley Hospital — o
ROBERT T. GILLMORE — Wesley Hospital — ro
MARK T GOLDSTINE — Wesley Hospital — ro 30

Tuesday, November 11th

JOHN W BIRK — Lake View Hospital — 2to 4 CHANNING W. BARKETT — Polichnic Hospital — 10 A. B. KEVES — Polichnic Hospital — 3 to 4 ALBERT GOLDSPOHN-Post-Graduate Hospital-11

G N BUSSEY - Ravenswood Hospital - 10 to 12 G W GREEN - Ravenswood Hospital - 8 to 10 CARL WAGNLR — St Joseph's Hospital — 10 to 12

M J SEIFERT — St Mary's of Nazareth Hospital —

W E SCHROLDER - Weeley Hospital - 8 to 10 ALLLN B KAN WEL - Wesley Hospital - 4 to 6. PAUL B M IGAL SON - Wesley Hospital - q to 12 I CONI I Y - West Side Hospital - 10 to 12

Saturday, November 15th

N M PIRCY - Augustana Hospital - 8 to 10 I G DVAS — College of P and S — 1 to 3 JACOB FRANK - Columbus Hospital - 8 to 12 C VOLIVI - Columbus Extension Hospital - 9 to 12 WYLLY'S ANDREWS - Cook County Hospital -

E HUMISTON - Cook County Hospital - to to

PAUL F MORF - Cook County Hospital - 1 to 4 A G ZIMMERMAN - German Hospital - o to 12 II R CHISLLTT - Habnemann Hospital - 8.10 E KAILLE - Habnemann Hospital - 8 30 C 1 WYNI LOOP - Lake View Hospital - 8 to 10 II A MOJE - Lake View Hospital - 10 to 11 BI NIAMIN II BREAKSTONE - Maimonides Hospital - 10 to 12

J B MURPHY — Mercy Hospital — 8 30 to 12 CARL BECk — North Chicago Hospital — 9 to 11 EMIL G BICK — North Chicago Hospital — 9 to 11

Bismuth work only DAIL - Norwegian Deaconess Hospital - o to 11 PAUL GRONNERUD - Polichnic Hospital - 2 to 4 D W GRAIIAM — Presby terian Hospital — 2 to 5 W H Al LPORT — St Luke's Hospital — 2 AXEL WERELIUS - South Shore Hospital - o to 12

W E SCHRODDER - Wesley Hospital - 10 to 12 Days and Hours to be Announced

IAMI'S BURRY - Illinois Steel Co Hospital WILLIAM HESSERT — Alexan Brothers Hospital ARTHUR B FUSTACE — Post-Graduate Hospital S C PLUMMLR - St Luke's Hospital

GYNECOLOGICAL AND OBSTETRICAL CLINICS

CAREY CULBERTSON - Rush Medical College - 11 W M THOMPSON — St Joseph's Hospital — 9.
PHILIP S DOANE — St Joseph's Hospital — 2.30

W S BARNLS - Wesley Hospital - t

Wednesday, November 12th

HENRY F LEWIS - Cook County Hospital - 3 30 LESTER FRANKENTHAL - Michael Reese Hospital FRANK W LYNCH - Presbyterian Hospital -- 11 to 1.

J CLARENCE WEBSTER—Presbyteman Hospital—11.
N SPROAT HEANEY — Rush Medical College — 11. E C DUDLEY - St Luke's Hospital - 2 MARY G McEWEN - University Hospital - 9 to

ARTIUR IL CURTIS -- Wesley Hospital -- o

MARK T GOLDSTINE - Wesley Hospital - 10 30

Thursday, November 13th

CAREY CULBERTSON - Cook County Hospital - 8 A B. KEYI.5 - Cook County Hospital - 3 to 4 IOHN W. BIRK - Lake View Hospital - a to 4 I RANK T. ANDREWS — Mercy Hospital — 8 to 10
C v. BACHELLE — Polichnic Hospital — Afternoon
HENRY BANGA — Polichnic Hospital — 10 CHANNING W. BARRETT - Polichine Hospital - to WM B. I EffRING - Rush Medical College - 11 PHILIP'S DOANL — St Joseph's Hospital — a 30 W, S BARNES — Mercy Hospital — a ROBERT T GILLMORE — Wesley Hospital — 20 THOS I. WATKINS - Wesley Hospital - o

8

Friday, November 14th

A. B KEYES - Polichnic Hospital - 3 to 4 ALBERT GOLDSPOILN - Post-Graduate Hosp tal-11 CAREY CULBERTSON - Rush Medical College - 11 W. M THOUPSOY - St. Joseph's Hospital -- ;

Saturday, November 15th

LESTER I RANKENTHAL-Mithael Reese Hospital-o FRANK W. LYNCH - Presbyteman Hospital - 11 to 1 I. CLARENCE WEBSTER-Presbytenia Hospital-it

N SPROAT HEANEY - Rush Medical Colle

THOS I WATKINS -- Wesley Hospital -- 6

Days and Hours to be Announced

CHARLIAS BACON. L S BAILEY - Habsemann Hospital HENRY T BYLORD — West Side Hospital. I RANK CARLY PETER S CLARK JOSLPH B Dald E-Mercy Hospital, Wesley Hospital W A NEWVIN DORLAND.

DAVIS S HILLIS - Provident Hospital.

J C HOAG - St Luke's Hospital, RUDOLPH W HOLMES - Augustana Hospital, GUSTAY KOLISCHIE IRANKLIN II MARTIN, B A McBURNI'Y CHARLES L. PADDOCK - St. Luke's Hospital, CHARLES B REED - Wesley Hospital

ERNEST SAURI VIIAUS — West Side Hospital GI ORGE SCHMAUCH L > SIMON - Michael Reese Hospital HERBERT MARION STOWE BERTHA CAN HOOSEN - West Side Horseld.

GENITO-URINARY SURGICAL CLINICS

COMMITTEE LOUIS E. SCHMIDT, Chairman, WM F BELFIELD, ROBERT H. HERBET, GUSTAY KOLISCHER, VICTAL LESPINASSE

Monday, November 10th

GUSTAV ROLISCHER - Michael Reese Hospital -L W. BREVIERMAN -Office -4 to 6

Tuesday, November 11th

HERMAN L KRETSCHMER - Merian Brothers Hospital - S to 10 B. C. CORBUS - College of P and S - 8 to 10 HARRY A KRAUS - German Hospital - 4 to 5 L. W BREMERMAN - Lakeside Hospital - 8 ROBERT II HERBST - Polichnic Hospital - 4 to 6

Wednesday, November 12th

L. E. SCIIMIDT - Alexian Brothers Hospital - o to 11 F. KREISSL - Jefferson Fark Hospital - 2 to 3
GUSTAV KOLISCHLR - Michael Reese Hospital -L. W. BREMERMAN - Office -4 to 6

Thursday, November 13th

L W BRLMERMAN - Laberide Hospital - 8 ROBERT II HERBST - Policlinic Hospital - 4 to 6. J. S NAGEL - West Side Hospital - 3 to 5.

Triday, November 14th HERMAN L ARETSCHAFER - Alexan British

Hospital - 8 to 10 D N EISTNDRATH AND TRENCH & CARY-CA lege of P & S - a to 4 HARRY A ARAUS - German Hospital - 4 to 5. F KRLISSL — JeJerson Park Hospital — 7 to 4
LOUIS E SCHMINT—Michael Reese Hospital—9 to 11 B C. CORBUS — Post-Graduate Hospital — 3 to 6-WM T BELI ICLD — Presbyteman Hospital — 4 L W BRF WFRM NN — Disce — 4 to 6.

Salurday, November 15th L W BREMFRMAN - Lakeside Homital - 8.

V. D. LISPINASSE - Wesley Hospital - 3 to

ORAL SURGICAL CLINICS

COMMITTEE: TRUMAN W. BROPHT, Chamman, THOMAS L. GILMER, and WM. II G. LOGAN

Days and Hours to be Announced Later THOMAS L. GILMER - St. Luke's Hospital and Northwestern University Dental School, ARTHUR D BLACK - St. Luke's Hospital and Northwestern University Dental School WM. H. G LOGAN - Frances Willard Hospital.

TRUMAN W. BROPHY - Presbyterian Hospital and Frances Willard Hospital. HERBERT A.

Dental School POTTS - Northwestern Universit FREDERICK B MOOREHE ID - Presbyterian Ho pstal.

ORTHOPEDIC CLINICS

COMMITTEE E. W. RYERSON, Chairman, WALLACE BLANCHARD, CHARLES M. JACOBS, JOHN L. PORTER and HENRY B THOMAS

Monday, November 10th

E W RYERSON - Children's Memorial Hospital -3 to 6; Policlinic Hospital - 1 to 2 FHOMAS P. LYNAM - Home for Destitute Crippled Children - 2 to 4.

Thursday, November 1 1th

HENRY B THOMAS - Cook County Hospital - xx to E W. RYERSON - Home for Destitute Crippled Children - 2 to 4

Tuesday, November 11th

JOHN L PORTER - College of P and S - o to 11, Home for Destitute Crippled Children - 11 to 1
WALLACE BLANCHARD - Home for Destitute Crippled Children - 2 to 4

Friday, November 14th

WALLACE BLANCHARD - Home for Destitute Crip pled Children - 2 to 4

E. W. RYERSON - Polichnic Hospital - 1 to 3

Wednesday, November 12th

E W. RYERSON - Children's Memorial Hospital - 3 to 6, Policimic Hospital - 1 to #

B MAGNUSSON - Home for Destitute Crippled Children-2 to 4.

Saturday, November 15th

C. M JACOBS - Home for Destitute Crippled Children - 2 to 4

LARYNGOLOGICAL AND RHINOLOGICAL CLINICS

COMMITTEE FREDERICK MENGE, Chairman, WM I. BALLENGER, and JOHN EDWIN RHODES

Monday, November 10th

STANTON A FRIEDBERG - Cook County Hospital CHARLES M. ROBERTSON - Polichnic Hospital -P. J II FARRELL — St Joseph's Hospital — 3 to 5

Friday, November 14th D B HAYDEN - Central Free Dispensary - 2 to 4

STANTON A FRIEDBERG - Cook County Hospital OTTO T TREER - Polichnic Hospital - 4 to 5 WM L BALLENGER - College of P and S - 10 to 12 GEORGE E SHAMBAUGH - Rush Medical College, Senn Hall - 2 to 4 P J H FARRELL - Shendan Park Hospital - 2 to 4

Tuesday, November 11th

JOSEPH C BECK - Cook County Hospital - 3 to 6 OTTO T FREER - Policlinic Hospital - 4 to 5 CHARLES H LONG - Post-Graduate Hospital - 8 30 P. I II FARRELL - Sheridan Park Hospital - 4 to S

Saturday, November 15th

GEORGE W BOOT - Children's Memorial Hospital -JOSEPH C BECK - Cook County Hospital - 3 to 6. CHARLES H LONG - Post-Graduate Hospital - 8 30 to 12 ARTHUR M CORWIN - West Side Hospital - 8.30. Days and Hours to be Announced Later

Wednesday, November 12th

D. B HAYDEN -- Central Free Dispensary -- 2 to 4 BURTON HASELTINE - Hahnemann Hospital alternoon OTTO J STEIN - Post Graduate Hospital - 2 to 5 FREDERICK MENGE - Wesley Hospital - 8 to 12 R. H GOOD - Frances Willard Hospital - 3

Thursday, November 1 4th

JOSEPH C. BECK — Cook County Hospital — 3 to 6 RICHARD H BROWN — College of P and S — 9 to 11 CHARLES M ROBERTSON - Policipuc Hospital -2 30 to 5 CHARLES H LONG — Post-Graduate Hospital — 8 30 P. J II. FARRELL - St Joseph Hospital - 3 to 5

GEORGE W BOOT - Cook County Hospital FRANK E BRAWLEY - St Luke's Hospital J T CAMPBELL - Post Graduate Hospital J DENNIS -- Wesley Hospital MORTIMER TRANK - Michael Reese Hospital T M HARDIE - St Luke's Hospital I HOLINGER - St Chrabeth's Hospital F INGALS HARRY KAHN - Michael Reese Hospital O H MACLAY - Wesley Hospital O H MACLAY — westry Hospital GEORGE F. MARQUIS — St. Luke's Hospital JOHN E. RHODES — Presbyterian Hospital ROBERT SONNENSCHEIN — Rush Medical College

C B YOUNGER - Wesley Hospital

OPHTHALMOLOGICAL CLINICS

COMMITTEE WM H. WHERE, Chairman, I pware V L. BROWN and Cassills D. WESTCOTT

Monday, November 10th

WILLIS O'NANCE - Illinois Chantable Lye & Lar Infirmary - 1 30

G W MAHONEY - Polichmic Hospital - 9 W I RANK COLUMAN - Post-Graduate Hospit-4 WILLIAM H WILDER - Rush Medical Collect

2 30 Tuesday, November 11th

CHARLES II BEARD - Illinois Chantable Fac 1 1 c Infernary - 2'30.
ALTRED N MURRAY - Lake View Hospital CHARLLS II TRANCIS - Polichnic Hospital GLORGL I. SURLR - Post-Graduate Hospit 1

Wednesday, November 12th

J. B. LORING - College of P and 5 - 3 OSCAR DODD - Illinois Charitable Life & I it In S. MEAD HAGER - Policimic Hospital - 9 W. FRANK COLFM IN - Post Graduate Bospet d - o GEORGE F SUKER - Post-Graduate Hospital

Thursday, November 13th

WM. H WILDLR - Illinois Chantable Eye & Lar Hospital - 2 30 G. W MAHONEY - Polichnic Hospital - 9

Friday, November 14th

II W WOODRUIT - Illinois Chantable Eve & 1 stal -- t to WILLIAM MICKRAY - Lake View Hospital - 1 b CHARLES HELKANCIS - Polichnic Hospital - o W 11 1NK (OH EMAN - Post Graduate Homital

Saturday, November 15th

1 1 1 BROWN - Illinois Chantable Fie & Ear H · M. W. H. W. F. R. Polichnic Hospital - 9 (al tike | 1 | N K | R - Post Graduate Hospital - 2

Pix and Hours to be Announced Later

COLKNIL IELLOWS - Habnemann Hospital. LIFTH I THAT - Mercy Hospital Mark L. MI & 1 6. V. A - Michael Reese Hospital I I SALDER Michael Reese Hospital. REORY LLVIV sthwestern University and II (14)
(1813) 1 W(84) St Luke's Hospital.

IKANK MITCH! V Luke's Hospital (1-11 - 11 WI well I - St. Luke's Hospital ил гелинг I no ersity Hospital.

OTOLOGICAL CLINICS

COMMITTEE NORVALH PRESCE, Charman J Hours in and Grose I brandaton

Monday, November 10th

IRA FRANK - Michael Reese Hospital - 9. JOSEPH BECK - North Chicago Hospital - 3 to 6 L GORDON WILSON - Northwestern University Mediral School - 10

J HOLINGER - St Joseph's Hospital - 9 T. MELVILLE HARDIE - St Luke's Hospital

Tuesday, November 11th JOSEPH BECK - County Hospital - 3 to 6 H.H BOETTCHER - Illinois Lycand Ear Infirmary - 2 DAVID FISKE - Polichnic - 2:30 FRANK ALLPORT - St Luke's Hospital - s General eye, ear, nose and throat chance

Wednesday, November 12th

J. HOLINGER -- Alexan Brothers Hospital -- 9 JOHN A. CAVANAUGH -- Chicago Lye, Ear, Nose and Throat Hospital - 3 to 6
NORVALH PIERCE-Hinners Eyeand Earlinformary - 2 IOSEPH BECK — North Chicago Hospital — 3 to 6 O J. STEIN—Post Graduate Medical School—afternoon FRANK ALLPORT - St Luke's Hospital - 2 General eye, ear, nose and throat claus.

Thursday, November 13th DAVID FISKE - Children's Mental House I to 3
JOSEPH BECK - Cook County Handal Of the

HFRID IFHI - II thnemann Hospital - 230 CHARLES W Rubi RINON - Polichnic - 1.10

IRA FRANA - Michael Rrese Hospital - o I HOLLNGER St Joseph & Hospital - o

I rid is Vocember 14th

W A BMILLOUR - C Berr of P. & S - 10 to 1 II II BOLTTO HI R-Illinois Eye and Car los JOSE PH BI (h - Vorin Unicago - Hopital - 3 to DAVID IISBL - Pole line - 2 to GEORGE 1 MAMBAR GII - Rush Medical Colle Senn Hall - 2 to 4

FRANK AILPORT - St luke's Hospital - 2. eral eye our nose and throat clinic

Saturday, Vocember 15th

J HOLINGER - Alexan Brothers Hospital - 9
JOSEPH BLCK - Chicago Eye, Car, Nose and T Hospital - 3 to 6 JOHN A CAVAVAUGH - Chicago Eye, Car, Nose

Throat Hospital - 3 to 6 GEORGE W BOOT - Children's Memorial Hosp NORVAL II PIERCE - Illinois Eye and Ear

J CORDON WILSON - Northwestern University

